AD HOC WORKING GROUP REPORT

REPORT TO THE CANADA-NOVA SCOTIA OFFSHORE PETROLEUM BOARD

FEBRUARY 2003

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1.0 EXECUTIVE SUMMARY

Since 1998 when two licences were granted offshore Cape Breton followed by a third a year later, the prospect of potential oil and gas exploration and development in the near and offshore area of Cape Breton Island has been filled with questions and controversy. Through numerous public meetings, including a government directed Public Review, the issues, concerns and opportunities have become clarified and focused. The latest effort to combine knowledge, perspective and values on the issue was the work of 15 individuals (and their alternates) representing the major stakeholders on an Ad Hoc Working Group established by the Canada-Nova Scotia Offshore Petroleum Board.

Over the course of nine days of meetings and a conference call, the Members worked hard to reach shared statements on issues, concerns, opportunities and knowledge with good faith and good will. Participants represented sectors and communities with very different backgrounds, mandates, perspectives and interests. Four fishing industry representatives were joined by one representative from each of the following stakeholders: the federal government, the provincial government; Cape Breton Municipal governments, First Nations, business community, labour unions, the environmental community, a representative from each of the two companies applying to conduct seismic testing in the licence areas, a chair and a secretariat from the Canada-Nova Scotia Offshore Petroleum Board, and an ex-officio member from the Department of Fisheries and Oceans.

The Ad Hoc Working Group was assisted with its task by the Science Review Working Group. This group was composed of eight knowledgeable and credible scientists with a range of scientific backgrounds and experience. The Science Review Working Group reviewed the science related to the proposed activities and produced a detailed report for use by the Ad Hoc Working Group. The Science Review was accepted by the Ad Hoc Working Group and held in high regard by all members. The report was used as guidance throughout the process.

While the Ad Hoc Working Group could not reach full agreement on every issue, the process succeeded in significantly raising the level of mutual understanding of the deeply felt concerns of all participants. When it came to the principle of a shared commitment to the future of Cape Breton Island's environment and economy, there was full consensus.

A critical difference of opinion eventually emerged on whether the level of potential risk was acceptable when it was balanced against the potential benefit that could come from possible future oil and gas discoveries and development. In general terms, when it came to areas where scientific advice suggested there was a risk but that judgement needed to be made on whether the risk was acceptable, the differences among working group members lead them to differing conclusions.

Some members felt the risk of negative effects from seismic activities on species already facing significant stresses and challenges from other human and environmental factors was too great. As result they believed a prohibition on oil and gas exploration in the three

licence areas off the coast of Cape Breton should be continued. Other members believed that the available scientific information indicated that the effects of seismic are likely to be minimal given the proposed mitigation measures. They viewed the risks to be acceptable in relation to the potential benefits of petroleum development to Cape Breton as a whole. These members were confident that the responsible regulatory authorities, including the Canada-Nova Scotia Offshore Petroleum Board, Department of Fisheries and Oceans and Environment Canada, would diligently exercise their responsibilities and expertise in approving the final plans for exploration by the proponents.

As a result, the Ad Hoc Working Group could not provide a unanimous recommendation about whether or not the Canada-Nova Scotia Offshore Petroleum Board should allow seismic testing as proposed by Hunt Oil Company and Corridor Resources Inc. Nevertheless, it is our hope that by stating the nature of the concerns, relying on the advice of the Science Review Working Group convened to assist us in this process, decision makers will better understand the perspectives and the nature of the differences.

The Ad Hoc Working Group agreed to the following over-arching principles:

- decision-making would be based on consensus or agreement on each issue;
- in the face of scientific uncertainty, consistent with the precautionary approach, it is preferable to err on the side of caution, but the absence of full scientific certainty shall not be used as a reason for postponing decision-making;
- development should meet the needs of the present without compromising the ability of future generations to meet their own needs;
- respect of the principle of Integrated Management with the intent of fair and equal treatment of all users of the ocean;
- priorities include: successful and sustainable fishing industries and tourism, the development of new economic opportunities for Cape Breton (including oil and gas) and the protection of the natural environment;
- protection of traditional and cultural values is important as is the socioeconomic health of Cape Breton; and
- the rights and cultural values of First Nations (including treaty rights) should be respected.

On the issue of the risks from conducting seismic exploration on the following species, the group agreed to shared statements of understanding outlining differing conclusions based on different perceptions of the science; snow crab, lobster, cod, hake, herring, mackerel, salmon, turtles, whales and on overall ecosystem effects.

The Ad Hoc Working Group agreed on a consensus basis that the proposed seismic programs for late fall would have minimal impacts on tourism; interference with fishing effort (conflicts with fishing vessels), seabirds, seals, tuna, and protected areas. It was also the consensus that although disturbance of seabed munitions sites was a serious issue that needed to be addressed if there was a future drilling program, the potential for disturbance from seismic was not significant.

As a result of the risks and benefits impacting different sectors and individuals, the members of the Ad Hoc Working Group have come to the following overarching conclusions:

- Some believe the risks are relatively small compared to the potential future economic benefits which, depending upon the outcome of exploration activities could be very significant for Cape Breton; and that the regulatory system is capable of authorizing activities under appropriate terms and conditions for mitigation and monitoring.
- Some believe the risks from seismic testing in the three licence areas are unacceptable and thus the prohibition on exploration activities should be continued.
- Some believe the risks are so unacceptable as to require the cancellation of the licences and a moratorium be declared on all oil and gas activities in the inshore area of Cape Breton Island until such time as adequate science has been conducted and adequate mitigation measures have been developed for these activities.

2.0 BACKGROUND

In July 1998, the Canada-Nova Scotia Offshore Petroleum Board (CNSOPB) issued two Exploration Licences (EL 2364 and EL 2365) to Hunt Oil Company and one year later issued an Exploration Licence to Corridor Resources Inc. (EL 2368). These licences are off the coast of Cape Breton.

In October 2000, the CNSOPB received a joint directive from the federal and provincial governments to conduct a public review of the effects of potential oil and gas exploration and drilling activities within these Exploration Licences.

Following this directive, an independent Public Review was conducted, and a final report entitled *"Commissioner's Report on the Effects of Potential Oil and Gas Exploration Offshore Cape Breton"* was submitted to the Board and to the governments in March 2002. The report included a summary of the views of the general public and interested parties, and findings on the effects of potential oil and gas activities within the licence areas. Several recommendations were made in the report, including:

- *that the Ministers and the CNSOPB broaden the consultative system to apply to the next stage of the decision-making process for the three Licence Areas, to include a cross-section of interests for the purpose of gaining advice about whether or not the proposed activities should proceed, and the specific measures to be taken in the event their decision is to proceed with exploration and drilling activities.*

The CNSOPB responded to the Public Review by publishing a *"Statement Regarding the Commissioner's Report on the Effects of Potential Oil and Gas Exploration Offshore Cape Breton"* in May 2002. In this statement, the CNSOPB outlined four steps they intended to take to move the process forward to determine whether exploration activities should proceed off the coast of Cape Breton. These steps included:

- continue the prohibition of activities on the licences until a determination is made as to whether exploration activities can proceed and, if so, on what terms and conditions;
- the Board will establish and invite appropriate groups to participate in the Ad Hoc Working Group;
- request the proponents to submit updated applications for work activity incorporating the knowledge gained from the public review process; and
- undertake expert review of the science, technical and experience utilizing the existing review mechanisms to determine if additional information is necessary to make informed decisions.

As a result of the recommendations of the Commissioner's report and the response of the CNSOPB, a prohibition on activities in the licence areas was continued, the proponents submitted updated applications, a science review was conducted and an Ad Hoc Working Group was established. The role of the Ad Hoc Working Group was to provide advice to the Board about whether the proposed activities should proceed, and the specific measures to be taken in the event the decision is to proceed with exploration. Participants include representatives from the three levels of government (Federal, Provincial, Municipal), First Nations, fishing organizations, environmental organizations, business community, trade unions, and licence holders.

The report that follows is the report of the Ad Hoc Working Group to the CNSOPB.

3.0 Overview of Proposed Activities

The discussions and deliberations of the Ad Hoc Working Group were based on two proposed seismic surveys within Exploration Licences 2368, 2364 and 2365. Brief descriptions of the proposed activities are provided below.

3.1 Overview of Activities Proposed by Hunt Oil Company

On August 6, 2002 Hunt Oil Company submitted a revised proposal to conduct a 2D Seismic Survey within EL2364 and EL2365, in the Sydney Bight area, commencing in the fall of 2002. Due to the additional special review process of this application (Ad Hoc Working Group and Science Review Working Group), Hunt Oil Company's proposal has been delayed until the fall of 2003.

They propose to collect 1571 line kilometres of 2D seismic data. Acquisition time for the survey is estimated to be 20 days. The area covered by the survey is 104 x 81 km, and the water depth of this area ranges from 50 to 350 metres. The plan is to collect 25 lines of data, ranging from 21 to 128 km in length. Hunt Oil Company propose to space the lines between 3 to 6 km and use of a 2000-4000 cu. in. air gun array.

See Appendix A for site map.

3.2 Overview of Activities Proposed by Corridor Resources Inc.

On July 9, 2002, Corridor Resources Inc. submitted a revised application to conduct a 2D Reflection Seismic Survey within EL2368, off the west coast of Cape Breton. An addendum to their application was submitted in September 2002, which was followed by an updated environmental assessment in October.

They anticipate collecting 500 kilometres of seismic data, commencing in September or October 2003, requiring approximately one week of time to acquire. The water depth of the survey area ranges from 50 to 70 metres. Their proposal is to collect 26 lines of seismic data. The spacing of the lines is 1 to 2 km, and regional tie lines spaced at 12 km. Corridor Resources propose to use a 1000 cu. in. air gun array.

See Appendix B for site map.

4.0 Approach and Procedures

4.1 Purpose

As recommended by the Commissioner, the Ad Hoc Working Group was assembled as a subsequent step to the regulatory process whereby the group acted as a consultative resource for the CNSOPB with respect to updated exploration plans by Hunt Oil Company and Corridor Resources Inc. off of Cape Breton Island.

The Ad Hoc Working Group has:

- Provided a forum for the exchange of relevant information; and
- Assembled a report to the CNSOPB representing a shared statement of interests and concerns of all members of the Ad Hoc Working Group related to whether the proposed activities should proceed and the specific measures to be taken in the event the decision is to proceed with exploration.

The report of the Ad Hoc Working Group should be considered by the CNSOPB prior to deciding whether or not to authorize the exploration activities.

4.2 Guiding Principles

The Ad Hoc Working Group agreed upon several operating principles to guide them through their processes, including:

- The role of the Ad Hoc Working Group would be to provide targeted advice to aid the Canada-Nova Scotia Offshore Petroleum Board in their decisions regarding the proposed activities in the licence areas off the coast of Cape Breton;

- All members would report to their constituents;

- Members would show mutual respect;

- There would be acknowledgement of the ongoing process;

- Acknowledgement that parties may take actions outside the Ad Hoc Working Group process to promote their causes, however, members would respect the process; and

- The Ad Hoc Working Group would receive and consider advice from the Science Review Working Group on their assessment of the existing scientific and experiential information in relation to the Hunt Oil Company and Corridor Resources Inc. environmental assessments, the DFO Habitat Status Report and the Public Review Commission's Findings.

The Ad Hoc Working Group agreed that they would use the following guiding principles in their decision making processes:

- Consensus decision-making

  The group agreed that decision-making would be based on consensus or agreement on each issue; and if consensus was not achieved, differences would be documented in the final report.

  The Ad Hoc Working Group agreed with the following statement from the National Round Table of the Environment and the Economy (NRTEE) that summaries this approach:

  "Although they (participants) may not agree on all aspects of the agreement, consensus is reached if all participants are willing to live with 'the total package'".

  If the Ad Hoc Working Group is unable to reach consensus by everyone, then the advice from the group would be drafted as shared statement of interests and concerns, outlining any differences in opinions.

- The Precautionary Approach

  The Department of Fisheries and Oceans, subscribing to the definition in the federal *Oceans Act*, defines the precautionary approach as:

  "in the face of scientific uncertainty, it is preferable to err on the side of caution"

  The Ad Hoc Working Group also recognized that the absence of full scientific certainty shall not be used as a reason for postponing decision-making.

- The Principle of Sustainable Development

The working group would operate using the principle of sustainable development, defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs.

- The Integrated Management Approach

  The working group recognizes that all users of the ocean should be treated fairly and equally.

- Scientific evidence is a key element in decision-making and should be given appropriate weight in discussions. The working group recognizes that scientific evidence will not always be available and in such cases the adoption of the precautionary approach will be important.

- A successful and sustainable fishing industry in Sydney Bight and the Southern Gulf of St. Lawrence is a priority;

- A successful and sustainable tourism industry for Cape Breton is a priority;

- The protection of the natural environment is a priority;

- Protection of traditional and cultural values is important;

- The rights and cultural values of First Nations (including treaty rights) should be respected;

- Socioeconomic health in Nova Scotia, particularly Cape Breton is important; and

- The development of new economic opportunities for Cape Breton is a priority, including opportunities for oil and gas development.

Attempts were made to use the guiding principles listed above while considering and discussing all relevant issues. This report reflects the discussions of the Ad Hoc Working Group.

4.3 Composition of the Ad Hoc Working Group

The Ad Hoc Working Group was composed of members from the following organizations:

- Federal Government
- Provincial Government
- Municipal Government
- First Nations

- Fishing Organizations (4 representatives)
- Environmental Organizations
- Business Organizations
- Trade Union Organizations
- Licence Holders (2 representatives)

Members were nominated to the group by their respective organizations, organizations that participated in the public review. Each member designated one alternate that could participate as an observer and did not participate when the member was at the table. The Chair and secretariat were representatives of the Canada-Nova Scotia Offshore Petroleum Board.

See Appendix C for a list of members of the Ad Hoc Working Group.

4.4 Timelines

Participants in the Ad Hoc Working Group were finalized in August 2002, with the first meeting of the Ad Hoc Working Group taking place on August 7, 2002. Several meetings were scheduled between August and December. The CNSOPB requested that the Ad Hoc Working Group provide them with their recommendations prior to December 31, 2002. Upon the request of the Ad Hoc Working Group, this timeline was extended to allow for finalization of the report.

4.5 General Approach of Deliberations

Members of the Ad Hoc Working Group participated in several meetings in Cape Breton, Nova Scotia. The first meeting took place on August 7, 2002 at the Wagmatcook Culture Centre. Mr. Glenn Miller, from Hunt Oil Company and Mr. Norm Miller, from Corridor Resources Inc. each gave a brief overview of the companies' proposed activities. The Chair of the Ad Hoc Working Group, Mr. Andy Parker, outlined the processes and expectations of the Ad Hoc Working Group. The nomination process for a Science Review Working Group and the perceived interaction between the two groups was explained. Process, procedures, and timelines for the group were discussed and several agreements were reached. Some members made a formal objection to the variations in procedure decided upon by the CNSOPB from those suggested in the Commissioner's report.

The second meeting occurred on August 28, 2002 at the Wagmatcook Culture Centre and focused primarily on process and procedures. A timeline and meeting schedule was developed. The Science Review process was discussed and members agreed to submit four nominations to the CNSOPB. The nominations were received and accepted by CNSOPB by September 6, 2002.

The third meeting took place on September 18, 2002 and included presentations on the issue of munitions dumpsites by Lieutenant C. Hough (Department of National Defence) and Mr. Myles Kehoe and Dr. Michael Ojoleck. Concern was expressed regarding the absence of a member representing tourism and a request was made to the CNSOPB to include a representative from tourism. The CNSOPB decided not to expand the membership and recommended that the tourism interests be included in business representation. Some members agreed tourism interests would be expressed through the business representative.

Meetings scheduled for October 16, November 6, 2002 and November 20, 2002 were cancelled in response to a delay in the Science Review process.

Copies of the report of the Science Review Working Group (SRWG) were sent to members of the Ad Hoc Working Group on November 29, 2002. See Appendix D for the Science Review.

The Ad Hoc Working Group met on December 4 and 5, 2002 where the report of the Science Review Working Group was discussed. On the first day of the meeting the majority of the Science Review Working Group was in attendance to present their report and participate in discussions related to their findings. The second day included discussion of remaining process issues and a continuation of the discussion on the results of the Science Review. The Ad Hoc Working Group agreed to accept the report of the Science Review Working Group and agreed to use the review to guide their discussions.

Subsequent meetings of the Ad Hoc Working Group were held on December 11, 2002, January 8 and 9, 2003 and January 15, 2003. In each of these meetings the Ad Hoc Working Group discussed a number of identified issues and worked towards developing a report of shared statements of interest and concerns for the CNSOPB. A final conference call was held on January 22, 2003 to finalize the contents of the report.

5.0 DISCUSSION

Arriving at a decision on whether or not to proceed with the proposed activities requires an understanding of both the potential risks and potential benefits associated with the activities. The comparison of risks versus benefits is complicated, as the risks and benefits often impact different sectors and individuals. A discussion of the complexity in assessing risks and benefits is provided below. The context in which the risks and benefits are to be assessed is also important. For the most part, this involves understanding the current economic conditions in Nova Scotia and in Cape Breton. A brief economic overview is provided in section 5.2 below.

With knowledge of the complexity of addressing risks and benefits and an understanding of the context in which these are to be assessed, the Ad Hoc Working Group was able to identify several issues with respect to the proposed activities in Exploration Licences 2368, 2364, and 2365.

The Ad Hoc Working Group relied heavily on the Science Review in discussions and report writing. Within this report the scientists frequently make reference to defined levels of scientific certainty which are important for identifying the margins of error associated with the statements made. These levels of certainty are defined below and have been highlighted in bold where used or referred to in this report.

Four levels of scientific assertion can be recognized and are as follows:

I. There is a complete series of precise and accurate observations, consistent with theory. The margins for error are narrow and enable the statement:

We are certain that ....

II. There is an incomplete series of observations (e.g., few observations from the particular ecosystem and species of interest), supplemented by a completed model / theoretical study. The margins for error are fairly narrow and enable the statement:

We are confident that ....

III. There is an incomplete series of observations supported by incomplete (e.g., calibrated but not validated) model / theoretical study. The margins for error are considerable. The statement can be:

We predict that ....

IV. There is an incomplete series of observations and either no model exists or the models are not validated or calibrated. The margins for error are substantial, but not as large as for pure chance. The statement can be:

It is our judgement that ....

In some cases the SRWG added the qualifier *preliminary* to their statements of judgement. Some members of the Ad Hoc Working Group viewed this qualifying statement as a level of certainty that is lower than that of a judgement.

Readers should refer to these levels of certainty when reading this report.

The identified issues were categorized into sections, 5.3 Potential Risks, 5.4 Potential Benefits and 5.5 Other Considerations. Discussion on each issue was broken down into the following components: Background, which provides a brief overview of the issue; Concerns, outlining concerns of Ad Hoc Working Group members or their constituents with respect to the issue (not necessarily agreed upon by all members); Potential Benefits, which outlines any potential benefits that could arise; Advice from the Science Review Working Group, which describes the advice given by the scientists with respect to a given issue; Consensus, which outlines areas of agreement within the group with respect to the issue; Other Information for Consideration, which provides information that was not necessarily agreed upon by all members, but felt by some to be important when considering the given issue; and Recommendations, which outlines the agreed upon

recommendations of the group with respect to a given issue. Several issues include a discussion of each of these components, while others include discussion of only a few.

Although each issue below has been discussed at length and in detail by the Ad Hoc Working Group, it is important to note that consensus was reached only on the items listed under Consensus and Recommendations. Further to this, not all members agree with a number of the assertions, concerns, or opinions contained within the other text in the Discussion section of this report.

It is also important to note that although all issues are important, they are not necessarily equal. The issues are presented in an order to foster increased understanding; this order does not necessarily represent prioritization of the issues.

5.1 A Discussion of Risks and Benefits

The Ad Hoc Working Group reviewed the known, potential and speculative risks and benefits of the proposed activities. The group agreed that the problem of weighing risks and benefits was more challenging because the risks and benefits did not impact the same individuals or sectors. Moreover, the perception of the magnitude of the risks and benefits is skewed. Where those being asked to accept risks are asked do so for what they perceive to be no benefit, their perception of the risk is increased. Similarly, those who wish for a benefit, but accept what appears to be no risk to them in pursuit of that potential benefit, their perception of the risk is reduced.

The Ad Hoc Working Group has relied on the SRWG to help in providing an objective assessment of the risk. The advice from Science Review identifies that there are risks, estimates the level of the risk, sets out the nature of the potential impacts and suggests measures to mitigate them. The willingness to accept a risk to an existing industry in order to gain potential benefits from a future industry is a value judgement.

While quantifying the nature of the risk suffers from areas of scientific uncertainty the estimation of benefits is also uncertain. We all agreed that the direct economic impact of seismic testing would be minimal (e.g. there would be minimal immediate direct employment and related opportunities.) However, that did not end the weighing of risks and benefits. Some members argued that without the seismic testing and the establishment of a commercially viable discovery of hydrocarbons, there would be no future oil and gas development in the licence areas. As a group, we accepted as an important principle that new economic opportunity for Cape Breton was a shared goal. Therefore, although we all agree there are no guarantees that oil and gas will be found, if no testing takes place, there is a certainty that no oil and gas will come from those licence areas. At the present time the only commercially viable method of evaluating whether drilling for oil and gas is warranted is by utilizing seismic airguns.

The weighing of risks and benefits is further complicated by the fact that the issue has come forward in regard to two particular proposals for seismic testing, not through a

generic coastal integrated management planning process, such as that contemplated in the *Oceans Act*.

Thus the nature of the weighing of risks and benefits is complex. Those stakeholders with an existing reliance on the fishery, tourism and scenic values are very reluctant to accept risks with no apparent benefits to them. Those suffering from high unemployment and eager to find new industries with the potential for new business and employment opportunities are hopeful that the testing will be both safe for the environment and other industries, and set the stage for exploration and discoveries that could provide a much-needed economic boost. Some might also find some off-setting environmental benefit if there were any clear connection between natural gas being found in Nova Scotian waters and coal-fired electrical generating stations being shut down (thus bringing the benefit of reduced sulphur dioxide, greenhouse gases and mercury). Although this is a reasonable objective to be pursued at the time of development plans, neither group of stakeholders can offer or receive guarantees at this time.

Some members of the Ad Hoc Working Group believe the concerns raised in the Cape Breton Review are similar to those raised on George's Bank. They believe the weighing of risks and benefits in the licence areas off of Cape Breton should be resolved in the same way, through a moratorium. Others, do not agree. They feel the public regulatory system has evolved to the point where specific activities can be carefully examined on their own merits and a determination be made that takes into account the balance of risks and benefits within the parameters of known science.

5.2 ECONOMIC OVERVIEW

The overall Nova Scotia economy is growing in a number of sectors. As a result, over the past six years employment has grown in all parts of the province and the unemployment rate has fallen. However, in the case of Cape Breton, the size of the population and the size of the labour force (people working and actively looking for work) is continuing to shrink. As a result, Cape Breton needs to explore economic opportunities in a number of sectors to turn around this out-migration. Those sectors include the fishery, tourism, other traditional industries, oil and gas and other service sectors. Jobs in the "new economy" are being created by small business in Cape Breton and many are dependant on the Island's ecological integrity.

It is agreed that the risk reward relationships on potential benefits that may be derived from natural gas exploration, development and production are not aligned. In fact, it is likely that those who feel they will be affected by risks from such activities may not directly receive any resulting benefits. Nevertheless, it is recognized that general economic growth helps the province provide services for all of us. It is also recognized that our children need a range of opportunities if they are to fulfill their potential at home in Cape Breton, in particular, or Nova Scotia in general. Those opportunities should include the fishery, tourism, the offshore oil and gas industry, as well as many other sectors of a modern economy.

It is with this understanding that the Ad Hoc Working Group approaches the issue of potential exploration activities off the coast of Cape Breton.

5.3 POTENTIAL RISKS

5.3.1 Issue – Potential Risks to Invertebrates

Snow crab

Snow Crab landings (from within the licence areas) have the highest gross landed value of any species in Cape Breton. Further value is added by processing a large portion of the snow crab catch in Cape Breton. Negative impacts to this economic flow would be detrimental to the economy of Cape Breton and the Province.

Hundreds of millions of snow crab are estimated to be within the licence areas. These areas are known to contain all life cycles of snow crab, from first moult to commercial adult. Western Cape Breton (involving the licence held by Corridor Resources Inc.) has one of the highest densities of nursery stocks in the Gulf of St. Lawrence. A significant number of future commercial snow crab evolve from this nursery stock.

Concerns

- A near absence of scientific knowledge on the impacts of seismic on populations of snow crab, particularly on pre-recruitment nursery stocks in Cape Breton waters and uncertainty of the potential risks to all snow crab.
- A near absence of understanding on long term behavioural effects of seismic on snow crab stocks.
- A near absence of understanding on the potential risks to snow crab during moulting periods.
- A detrimental effect on snow crab larvae in the licence areas may affect the establishment of seed stocks in other areas.
- The large concentrations of snow crab stocks in the seismic survey areas will be negatively affected by the proposed seismic activities.
- Experiential information indicates that snow crab respond to thunder and lightning storms and that snow crab catches are reduced in the days following a storm. The concern is that snow crab are responding to sound and may respond similarly to seismic.
- Seismic may displace snow crab from one Crab Fishing Area (CFA) to another or one section of an area to another within a CFA.
- If harmful effects to nursery stocks result from seismic testing then a negative impact to the commercial fishery will only be seen seven to ten years following the initial harm.

Advice from the Science Review Working Group

- It is the ***preliminary judgement*** (see definition on page 12) of the SRWG that there would be no perceptible negative impact from seismic activities on snow crab populations. The SRWG notes that the preliminary results of the Newfoundland based ESRF study on the seismic impacts on snow crab are consistent with their ***judgement***. The scientists note that this study will provide useful information on physical and physiological effects and improve understanding on behavioural effects and catch rates. There may still be outstanding uncertainties once the results of the study are known. The SRWG recommends that the CNSOPB wait for the results of this study before making a decision on the significance of impacts of the proposed activities on snow crab. In the conclusion of their report, the SRWG notes that uncertainties regarding the impacts to snow crab was one of the most critical issues. As a general recommendation, the SRWG acknowledges that further research and well defined Environmental Effects Monitoring (EEM) studies can assist in increasing knowledge where gaps are known to exist.

Consensus

- The Ad Hoc Working Group accepts that the snow crab industry makes a substantial annual contribution to the economy of Nova Scotia, particularly Cape Breton.
- The Ad Hoc Working Group acknowledges that the Newfoundland based ESRF crab study now underway is not complete and has not been peer reviewed. It further acknowledges that, at the time of writing this report, it has no knowledge of any peer reviewed scientific information pertaining specifically to the impacts of seismic on snow crab.
- The Ad Hoc Working Group acknowledges that there is no clearly defined compensation program in place should harm to the snow crab industry result from the proposed seismic project. This applies to all fisheries under risk.

Recommendations

In balancing the potential risks to crab with the potential benefits of oil and gas development, the Ad Hoc Working Group agreed that the following views were held:

- Some members believe that there is adequate knowledge to make a decision on whether the activities should proceed. This belief is based upon the ***preliminary judgement*** (see definition on page 12) of the SRWG is that there would be no perceptible negative impact on snow crab populations; that preliminary results of the ESRF crab study are consistent with this judgement and that mitigative measures would adequately reduce these risks. Furthermore, these members know of no evidence world wide that indicates any adverse effects to crustaceans from the millions of kilometres of seismic conducted elsewhere.
- Some members believe that not enough is known about the effects of seismic on snow crab for the seismic activities to proceed, nor that the proposed mitigation measures would adequately reduce the potential risk.
- Some members believe that not enough is known about the potential effects of oil and gas exploration and development on snow crab for the activities to proceed. These

members believe that the applications to conduct seismic should be rejected, that the prohibition of activities on the licence areas should be extended, and that a moratorium should be placed on oil and gas exploration on the inshore waters of Cape Breton Island. The members believe that these measures should remain in place until adequate science has been conducted and adequate mitigation measures for exploration and development procedures have been assured by the proponents.

The SRWG recommended that CNSOPB wait for the results of the ESRF crab study before making a decision on the significance of impacts of the proposed activities to crab. The Ad Hoc Working Group acknowledges this recommendation and the following views held by members relating to this recommendation:

- Some members believe the ESRF study needs to be reviewed by other scientists and people in the fishing and oil and gas industry before the results could be considered finalized. These members also believe that this recommendation would preclude any decision on seismic until this work is finalized.
- Some members believe that this recommendation would allow the CNSOPB to make a decision now on whether or not the proposed activities should proceed based on currently available knowledge with respect to snow crab, and if the activities are approved, the CNSOPB should consider the results of the ESRF crab study in the design of mitigation plans.

Lobster

The lobster fishing areas off both coasts of Cape Breton are some of the more productive areas in Nova Scotia and provide a livelihood for almost every fisherman living in the area, thus making lobster the backbone of the Cape Breton fishery.

Concerns

- Lobster was not specifically addressed by the SRWG.
- Direct scientific research has not been conducted on the impacts of seismic, or any other exploration activities, on lobster populations.
- Little attention has been paid to lobster in the applications for seismic, as landings are typically caught close to shore, though the entire distribution of lobster is not well known.
- Plans by Hunt Oil Company to conduct seismic as close as 6km from shore may adversely affect lobsters thought to be overwintering in waters of 30-m depth and greater.
- Whether or not lobsters migrate is unknown.
- Experiential information from fishermen indicates that lobster respond to thunder and lightning storms and that lobster catches are always reduced in the days following a storm. The concern is that lobster are responding to sound and may respond similarly to seismic.

Advice from the Science Review Working Group

- The SRWG did not specifically address lobster as an issue, however, they did accept that snow crab could serve as a model species for all invertebrates. The SRWG makes

the ***preliminary judgement*** (see definition on page 12) that there would be no perceptible negative impacts to snow crab, and through the extension of crab as a model for all benthic invertebrates, the Ad Hoc Working Group is applying this ***preliminary judgement*** to lobster.

Consensus

- Some members of the Ad Hoc Working Group agree that the ***preliminary judgement*** of the SRWG relating to snow crab also applies to lobster. Some members of the Ad Hoc Working Group disagree and have indicated that lobster fishermen are aware of important differences between these species.
- The Ad Hoc Working Group agrees that the impacts on lobsters are likely to be similar to the impacts on crab. There is a desire to acquire scientific evidence to confirm this assumption.

Other Information for Consideration

- Effects on lobster might be mitigated in the Hunt Oil Company proposed seismic survey by removing the survey lines closer to the coast.

Recommendations

In balancing the potential risks to lobster with the potential benefits of oil and gas development, the Ad Hoc Working Group agreed that the following views were held:

- Some members believe that there is adequate knowledge to make a decision on whether the activities should proceed. This belief is based upon the ***preliminary judgement*** (see definition on page 12) of the SRWG that indicates that there would be no perceptible negative impact on snow crab populations; that preliminary results of the ESRF crab study are consistent with this judgement; that snow crab serves as an adequate model for lobster; and that mitigative measures would adequately reduce these risks. Furthermore, these members know of no evidence world wide that indicates any adverse effects to crustaceans from the millions of kilometres of seismic conducted elsewhere.
- Some members believe that not enough is known about the effects of seismic on lobster for the seismic activities to proceed, nor that the proposed mitigation measures would adequately reduce the potential risk.

The results of the ESRF crab study should be reviewed (through the means suggested in the section on snow crab) and, where appropriate, applied to lobster.

The Ad Hoc Working Group encourages the development of studies to verify whether the extrapolation of results from crab studies to lobster is accurate. If the activities proceed, the proposed activities should be used as opportunities for such studies. However, the Ad Hoc Working Group has recognized that although gaining an understanding of the potential impacts is important, it cannot be used as the primary reason for seismic testing.

5.3.2 Issue - Potential Risks to Fish

Cod

There are two distinct cod stocks under consideration for this report; the 4Vn cod stock resident in the area of Sydney Bight and the 4T cod stock which spends its summer in the Southern Gulf of St. Lawrence and overwinters in Sydney Bight. The 4T cod stock migrates into the 4Vn area in (usually) late October - early November, returning to the Gulf region in early April.

The 4T cod stock has been a primary groundfish species for the commercial fishery since the early 1900's. Prior to the collapse of the 4T cod stock the quota was in the range of 60,000 tonnes and higher in the early years. The 4Vn cod stock quota prior to the moratorium was in the range of 7,500 tonnes. In earlier years the quota was as high as 10,000 tonnes and formed a significant portion of income for inshore fish harvesters and their coastal communities. Prior to the last twenty years, cod in 4Vn was the major income producer for inshore fish harvesters.

Both the 4T and the 4Vn cod stocks were placed under moratorium in 1993. The moratorium continues present day for the 4Vn cod, which are considered to be in a fragile state. The 4T cod fishery was re-opened in 1999 at approximately 10% (6,000 tonnes) of its former levels. However, recent scientific information indicates that the 4T cod stock continues to decline and another moratorium may well be imposed during April 2003 following Department of Fisheries and Oceans science reviews in February/March 2003.

Concerns

- Migration patterns of 4T & 4Vn cod would be adversely affected during October and November.
- Delaying seismic activities in the 4Vn area until late November/early December increases the risk to the over wintering 4T cod.
- Impacts of seismic activity on 4Vn juvenile cod may be far greater than adult cod due to reduced movement of the juvenile cod stock.
- Delaying seismic activity in the licence area held by Corridor Resources Inc. until late November may reduce the impact on 4T cod, however, other migrating stocks may be negatively impacted.
- Additional stress on cod stocks may further impede recovery.
- There does not appear to be any window of opportunity for seismic activity that will ensure minimal impacts on the 4Vn resident cod stock.

Advice from the Science Review Working Group

- The SRWG acknowledges that the 4Vn cod stock is considered to be in a fragile state, following severe declines in abundance in previous decades. The SRWG indicates that the 4T cod stock is not as severely depleted as the 4Vn stock, but that it has not been recovering. They also indicate that no window of opportunity exists between October and December that will eliminate the risks to finfish and that seismic in Sydney Bight may disrupt cod migration and affect overwintering stocks.

Whether or not these are acceptable risks calls for value judgements, taking into account the status of these stocks. The SRWG advises that for the Hunt Oil Company application, altering the sequence of seismic lines could be an effective mitigation measure and that the lowest possible power of array should be used if the project is to proceed.

Consensus

- The Ad Hoc Working Group accepts the advice of the SRWG that the 4Vn resident cod stock is in a fragile state and that the 4T cod stock has not been recovering.
- The Ad Hoc Working Group accepts the conclusion of the SRWG that no opportunity exists for seismic testing between October and December that will eliminate the risks to all cod.
- Both cod stocks must be given all opportunities to recover that are both feasible and reasonable.

Recommendations

In balancing the potential risks to cod against the potential benefits of oil and gas development, the Ad Hoc Working Group agreed that the following views were held:

- Some members felt the risk to cod stocks was acceptable given: the small scale of the seismic surveys; the low risk of harm to the cod population; the mitigation measures proposed; and the recommendation of the SRWG for EEM.
- Some members of the Ad Hoc Working Group disagreed and felt that: there was no period which eliminated the risks to cod in either area; the seismic program in Sydney Bight was large in relation to the cod population; and viewed any additional risk to either cod population as unacceptable. These members do not accept that the mitigation measures are sufficient to protect cod.

If the seismic activity is to proceed, the CNSOPB, in consultation with DFO should consider ways to minimize risks to cod.

White hake

White hake in the Southern Gulf of St. Lawrence has consistently been the third or fourth most important groundfish fishery. Pre-moratorium landings have averaged close to 5700 tonnes over a 35 year period (1960 -1994). The 'Strait' component was responsible for 90 percent of the 4T white hake landings. It has been under moratorium since 1995. One of the last large concentrations of white hake can be found seasonally in St. Georges Bay, a spawning area. Recovery has been very slow and biomass is still at historically low levels

White hake, like cod, is a bottom dwelling fish species. It occurs as two distinct sub-populations in the Southern Gulf of St. Lawrence. One population is said to be found in the deep waters of the Laurentian Channel while the second is in the coastal waters of the Southern Gulf.

Migration of white hake through the Corridor Resources Inc. licence area is later than cod, November-December as opposed to late October - early November for cod.

Concerns

- Delaying the seismic survey until mid-November to reduce impacts on cod would only increase any effects on hake.
- There appears to be no fall "window" for seismic that eliminates risks to white hake.
- White hake is known to be a slow swimmer, taking longer than other species getting from point A to point B.
- The seismic survey area of Corridor Resources Inc. lies astride the migration route of white hake and could alter migration patterns.
- Recovery of white hake could be further impaired.
- Some white hake may migrate from 4T into 4Vn and beyond.

Advice from the Science Review Working Group

- The SRWG identifies white hake as in a precarious state. The SRWG concludes that no window of opportunity exists between October and December that will eliminate the risks to white hake. Delaying the surveys west of Cape Breton into November would increase the risk to hake. The risk is that the seismic survey will disrupt the migration to the extent that it has population level effects on hake. Due to the short duration of the Corridor Resources Inc. survey and the low power of the airguns this risk is judged to be very low. Whether or not this is an acceptable risk calls for a value judgement, taking into account the status of these stocks. In the conclusion of their report, the SRWG notes that uncertainties regarding the impacts to finfish was one of the most critical issues.

Consensus

- The Ad Hoc Working Group agrees with the SRWG that white hake is in a depressed state and that no opportunity exists between October and December that will eliminate the risks to white hake and that delaying the surveys into November would increase the risk to white hake.
- White hake stocks require re-building and may require some form of protection for this to occur.

Recommendations

In balancing the potential risks to white hake against the potential benefits of oil and gas development, the Ad Hoc Working Group agreed that the following views were held:

- Some members of the group felt the risk to white hake stocks was acceptable.
- Some members of the Ad Hoc Working Group disagreed and viewed any additional risk to the precarious white hake population as unacceptable.

Herring

Herring is the most important of the small pelagic fish, supporting large commercial fisheries, and value-added processing. Herring is also extremely important in the food chain as the desired food for any species above it in the food chain. It is also extremely important as a bait fish.

Herring is also probably the most sensitive fish in terms of acoustic impacts, due to the specialized biological adaptation of its swim bladder.

A large seiner fishery for 4T herring takes place north of Cape Smokey from November on. There is a large and very lucrative herring fishery for fall-spawning herring that occurs off of Glace Bay to North Sydney in September and October. These herring are spawning until the end of October, with their larvae in the water for at least a month following.

Concern

- In the Southern Gulf there is a large population of herring. Many of these, especially the juvenile fish, stay in the Gulf during the winter and some would likely be in the area where seismic is proposed.
- There is also a large part of the population of 4T herring that is known to migrate in October and November into 4Vn to overwinter there. At the same time there is a mix of 4T herring, 4Vn local stocks, Bras d'Or Lakes herring and 4W herring that may mix in 4Vn waters over the winter.
- While some of the components of the herring stocks are quite abundant, others are not.
- The declining Bras d'Or Lakes herring population may be disturbed on their annual migration into Sydney Bight.
- The Bras d'Or herring population is important to the First Nations.

Advice from the Science Review Working Group

- The SRWG indicates that some herring are likely to be influenced by seismic sounds with the possible results of moving out of normal overwintering grounds. They indicate that herring spawning in nearshore areas occurs in Sydney Bight from mid August to mid October, occasionally extending into early December. There is potential for the last of the spawning adults to be disturbed by seismic sound. The SRWG indicates that herring are not in the same fragile state as cod and therefore population level effects are unlikely and of little concern.

Consensus

- The Ad Hoc Working Group agrees with the SRWG that some herring are likely to be influenced by seismic sounds and may move out of normal overwintering grounds.
- The Ad Hoc Working Group agrees with the SRWG that some late spawning herring may be disturbed by the seismic sound.

Other Information for Consideration

- There is a large ongoing herring fishery taking place in the Gulf. There is another herring fishery in Glace Bay in the fall. The herring fishery in Bras d'Or was closed in 1997.

Recommendations

In balancing the potential risks to herring against the potential benefits of oil and gas development, the Ad Hoc Working Group agreed that the following views were held:

- Some members felt the risk to herring stocks was acceptable given: the small scale of the seismic surveys; the low risk of harm to the herring populations; the mitigation measures proposed; and the recommendation of the SRWG for EEM.
- Some members of the Ad Hoc Working Group disagreed and believe that the risks to the depleted Bras d'Or herring stock would be unacceptable if the seismic activities were run within 50km of Bird Islands.

All members of the Ad Hoc Working Group agree that, if seismic activities proceed, the CNSOPB should consider the use of herring spawning areas in the development of a model of the propagation of sound along critical paths to determine mitigation measures required. Consideration should be given to the validation of models prior to conducting seismic activities. This validation should take place early enough for regulatory bodies to act or for operators to make realistic adjustments to pre-defined scales.

Atlantic salmon

Atlantic salmon have been identified as a species of concern by stakeholders, especially through the Atlantic Salmon Federation and the Margaree Salmon Association. In their submission to the Public Review, and included in the Commissioner's Report, the Atlantic Salmon Federation noted that Atlantic salmon populations throughout North America are at historic low levels. Atlantic salmon in areas of Atlantic Canada have been identified as an endangered species by the COSEWIC, but that designation does not directly impact the licence areas in question. Nevertheless, it is clear the Atlantic salmon populations globally are facing multiple stressors and are in trouble. Over-fishing is no longer a factor as the commercial fishery in Atlantic Canada for Atlantic salmon was ended years ago. Bycatch and fishing activities outside of Canadian waters may be a factor contributing to population effects.

Salmon appear to be suffering from the cumulative impacts of habitat degradation, overfishing, marine and land-based sources of pollution, and possibly increased UV penetration and climate change. Significant salmon runs in many Atlantic rivers have been lost. Within the three licence areas, salmon from the Baddeck, Middle, North, Clyburn, Aspy, Cheticamp and Margaree Rivers would be found during certain times of the year. The Margaree River is designated as a National Heritage River and has a

watershed management plan developed by all users and stakeholders. One primary factor to its designation was its salmon population.

In 2000, the Margaree River was the only river found by the Department of Fisheries and Oceans to have met salmon conservation requirements. The sports fishery for Atlantic salmon in Cape Breton creates significant economic activity (in guiding, lodges, etc). Due to constitutionally guaranteed rights, the Mi'kmaq are also permitted a limited fishery in the Southern Gulf of St. Lawrence. Their rights in this regard are considered elsewhere in this report.

Concerns

- Seismic activities could adversely affect salmon populations.
- The report of the SRWG covers the impacts on Atlantic salmon only in the context of the Corridor Resources Inc. application. Fishermen within the Ad Hoc Working Group pointed out that the salmon from the Baddeck, North and Middle Rivers would also be a factor to be considered in the Hunt Oil Company application. However, it is expected that salmon in this area would be less of a concern than those in the Southern Gulf of St. Lawrence, as the salmon rivers all enter estuarine areas well separated from the Bight.

Advice from the Science Review Working Group

- The SRWG reached consensus on the following points: 1) salmon are about ten times less able to hear low-frequency sound than are cod; 2) salmon have a very strong migratory drive; 3) therefore, salmon would tend to ignore seismic-survey sounds that would tend to cause cod to move away. The SRWG identifies that there may be potential impacts on spawning run salmon in the sea if the survey started in October and also on young salmon spending their first winter at sea. The SRWG indicates that if the seismic was delayed until November 1 on the Southern Gulf of St. Lawrence licence area the risk to spawning run salmon could be almost eliminated. The SRWG made no comment about timing of seismic in relation to similar spawning run salmon on the Sydney Bight side of the Island.

Consensus

- The Ad Hoc Working Group members accept the advice of the SRWG that the risk to Atlantic salmon is likely less of a risk than that to cod from the seismic testing.
- The risk to salmon from the presence of first year salmon wintering at sea is unknown.

Other Information for Consideration

- The issue of young salmon spending their first winter at sea is difficult. The SRWG notes that there is little known about the location of year-old salmon once they disperse from the mouth of the river. It is not known if some or if many salmon would be in the survey area. The SRWG indicated that any salmon in the area would likely respond in the same manner as cod, but perhaps to a lesser extent and that "the consequences of that disturbance to their survival and growth are unknown."

- The SRWG made no comment on first year salmon within the Hunt Oil Company licence area, although fishermen from the Sydney Bight area confirm that the same concern would exist in Sydney Bight for Atlantic salmon.

Recommendations

In balancing the risk to Atlantic salmon in Cape Breton salmon bearing rivers against the potential benefits of oil and gas development, the Ad Hoc Working Group agreed that the following views were held:

- Some members of the group felt confident that the SRWG advice, including advice that due to the short duration of the survey and the low power of the airguns, this risk is ***judged*** (see definition on page 12) to be very low in the Gulf and should provide adequate assurance to the Board to allow the seismic to take place.
- Some members of the Ad Hoc Working Group viewed the additional risk to salmon populations was unwarranted. The level of concern about the risk was influenced by the question of timing as all members of the Ad Hoc Working Group agreed with the SRWG that any risks to spawning run salmon would be almost completely eliminated by conducting seismic surveys after November 1. This is not a mitigation measure for those salmon spending their first year at sea.

If seismic activities are to proceed, the CNSOPB should ensure that potential effects on salmon are adequately mitigated. The Atlantic Salmon Federation has indicated a willingness to work with the CNSOPB to ensure that potential impacts to salmon are reduced.

Bluefin tuna

Bluefin tuna fished in Atlantic Canada are part of the west Atlantic stock and are managed by the International Commission for the Conservation of Atlantic Tunas (ICCAT), because of its migratory nature. Bluefin tuna are thought to spawn during April - June in the Gulf of Mexico and the Florida Straits. According to the Atlantic Bluefin Tuna Integrated Fisheries Management Plan (Effective 2002), juveniles are thought to occur in the summer over the Continental Shelf, primarily from 35 degrees North to 41 degrees North and offshore of that area in the winter.

In 2002, there were 598 bluefin tuna licenses in the Gulf Region, 66 in the Scotia-Fundy Region, 55 in the Newfoundland Region and 54 in the Quebec Region. One of the major fishing areas is the Southern Gulf, including St. Georges Bay, north of the Canso Causeway. The season runs from January 1 through December 31 each year but individual management areas determine when to start and stop their respective fisheries. Large bluefin tuna are usually in our waters by late July and the fishery usually ends by mid-October.

Concerns

- Seismic in the early fall could impact these large, highly developed fish.
- Bluefin tuna have an unpredictable and changeable distribution based on availability of prey, schooling behaviours and preferences for waters of particular temperatures and migration may be later in some years.
- Potential impact to a fishery with a substantial landed value per annum.

Advice from the Science Review Working Group

- The Science Review states that tuna should be much less affected than herring due to biological differences, mainly the lack of ability to hear and the lack of swim bladders.

Consensus

- The Ad Hoc Working Group accepts the knowledge of fishers that bluefin tuna react differently to different types of fishing boats and gear, which may imply hearing or motion sensitivities in tuna.
- The Ad Hoc Working Group agrees with the SRWG that tuna is likely to be less affected by seismic sound than herring.
- Tuna will be gone from the Gulf in late November-December.
- Maintaining a productive tuna fishery is important.

Recommendation

Given the lack of published literature on tuna, the Ad Hoc Working Group encourages the CNSOPB to be supportive of research studies relating to the effects of oil and gas development on tuna.

Mackerel

Mackerel is the most important bait used in all fisheries, including lobster, snow crab, and groundfish longline. It is also a wonderful food fish. For most fishermen, who only have the opportunity to fish for lobster, the fall handline fishery for mackerel can be a very important part of fishermen's livelihoods.

The Southern Gulf of St. Lawrence is the main spawning area for Atlantic mackerel in Canadian waters. The mackerel migrate from along the shores of New England, entering the Gulf in the spring, and exiting in the fall. The largest landings of mackerel are made in the Southern Gulf and around Cape Breton Island, mostly in June, and then September through November. The mackerel are believed to all migrate in and out of the Gulf and pass within three miles of Cape North on their journey. Mackerel are extremely sensitive to water temperature and oxygen content.

Concern

- The mackerel migration, which lasts up to the end of November, could be altered thereby leading to potential impacts on the species.
- Mackerel are very temperature sensitive, therefore any displacement into colder waters could have an effect on survival.

Advice from the Science Review Working Group

- The Science Review states that mackerel should be much less affected than herring due to biological differences, mainly the lack of ability to hear and the lack of swim bladders.

Consensus

- The Ad Hoc Working Group agrees with the SRWG that mackerel are less sensitive than herring.

Recommendation

If the activities proceed, the CNSOPB should consult with the Department of Fisheries and Oceans to determine the timing of mackerel migration.

5.3.3 Issue – Potential Risks to Fishing Activity

Timing is important when managing the potential risks to fishing activity. Until the end of October seismic activities will be in conflict with some fisheries. There is an active herring fishery taking place within the Sydney Bight area at the time of the proposed survey. Little fishing activity is expected in the Southern Gulf of St. Lawrence at the time of the proposed survey.

A standard procedure exists for consultation between seismic companies and fishing vessels to minimize any potential physical interactions between the two.

Concerns

- Potential for seismic to interfere with catch per unit effort (CPUE).
- Physical limits placed on fishing by seismic vessel.

Advice from the Science Review Working Group

- The SRWG reached consensus that there may be a local redistribution of stock in the vicinity of seismic survey areas, which could affect CPUE for fisheries operating while seismic is taking place. The SRWG acknowledges that: 1) standard procedures exist for consultation between seismic companies and fishing vessels; 2) that efforts are made to minimize any physical interaction; and 3) that a standard compensation program for damaged gear exists. The SRWG advises that additional action is not required.

Consensus

- The Ad Hoc Working Group agrees with the SRWG that there may be a local redistribution of stock in the vicinity of seismic survey areas, which could affect CPUE for fisheries operating while seismic is taking place.
- There is potential for some conflict with fishing activity at the proposed survey times and efforts should be made to reduce the probability of such conflicts.
- The Ad Hoc Working Group agrees with the SRWG and recognizes that adequate processes are in place to deal with these potential conflicts.

Recommendation

The CNSOPB should continue to implement its current process for addressing potential conflicts with fishing activity.

If the seismic activities proceed, some members recommend that the activities in Sydney Bight be conducted after November 1, 2003 to eliminate potential risks to the Glace Bay herring fishery.

5.3.4 Issue – Potential Risks to Scientific Fish Surveys

Scientific fish surveys are carried out to assist the Department of Fisheries and Oceans with fisheries management. A fishery is dependant on the results of scientific fish surveys, therefore the acquisition of accurate data is important.

The CNSOPB currently undertakes standard consultation with the Department of Fisheries and Oceans and its Fisheries and Environmental Advisory Committee to ensure that potential conflicts with scientific fish surveys are avoided.

Concern

- Seismic operations will interfere with scientific fish survey data.

Advice from the Science Review Working Group

- The SRWG expresses with ***confidence*** (see definition on page 12) that the procedural mechanism in place is sufficient for ensuring that fish surveys will not be significantly affected by seismic surveys.

Consensus

- The Ad Hoc Working Group agrees with the advice of the SRWG that the procedural mechanism currently in place is sufficient for ensuring that scientific fish surveys would not be significantly affected by seismic activities. The importance of this procedural mechanism, however, should be emphasised, as effective fisheries management is highly dependant on accurate fish survey results.

Recommendation

The CNSOPB should continue to implement its current process for addressing potential conflicts with scientific fish surveys.

5.3.5 Issue – Potential Risks to Turtles

Three species of sea turtles are found in Nova Scotian waters, but the species about which greatest concern has been expressed is the leatherback turtle. The leatherback turtle, which was only discovered in Nova Scotian waters in 1999, is listed as Endangered by the COSEWIC. Submissions from the N.S. Leatherback Turtle Working Group of Dalhousie University were made to the Public Review. In the last three years, the Dalhousie group reports that between 75 to 100 leatherbacks have been seen in Sydney Bight and the Southern Gulf of St. Lawrence.

Concerns

- That seismic testing could disturb leatherbacks within the survey areas.

Advice from the Science Review Working Group

- The SRWG agreed that the turtles would be likely to hear the seismic and would attempt to avoid the noise. They note that turtle swimming speeds are 'relatively low' and the group recommended that if any seismic was to take place that 'ramp-up' of seismic sound begin 30 minutes before testing to allow any sea turtles in the area to swim away. The SRWG ***predicts*** (see definition on page 12) that the impacts are likely to be sublethal 'affecting fitness of exposed individuals only.' The group notes that the mitigation measures could reduce the risks to turtles and that conducting the survey after the turtles have left the area would eliminate risks. The SRWG did not provide any advice on when turtles leave the area, although Hunt Oil Company's application suggests that by mid-November the Leatherbacks have migrated out of the area.

Consensus

- The Ad Hoc Working Group agrees with the SRWG that with the proposed mitigation measures any potential effects from seismic on turtles are not likely to be at the population level.
- Timing seismic programs for after mid November may avoid any potential impacts to turtles.

Other Information for Consideration

- With the recent passage and Royal Assent to the federal *Species at Risk Act*, it is not merely population level impacts that must be considered. Under federal law, the impact on each individual leatherback turtle is now a concern. Under the *Species at Risk Act*, it is illegal to harass or kill an individual within a species classified as endangered.

Recommendation

The Ad Hoc Working Group members agree that the CNSOPB should consult with the Department of Fisheries and Oceans, Environment Canada and scientists within the N.S. Leatherback Turtle Working Group, to ensure that the recovery of the leatherback turtle is not compromised.

5.3.6 Issue – Potential Risks to Sea Associated Birds

A number of significant bird colonies are present in and adjacent to the licence areas in question. Bird Islands in the Sydney Bight area and Margaree Island in the Southern Gulf have protected status (Bird Islands under provincial protection and Margaree Island under federal Canadian Wildlife Area designation.) As well Ingonish Island, Green Island and Port Morien are recognized as significant habitat for sea bird colonies. Populations of Atlantic Puffin, Black Guillemot and Leaches Storm Petrel are found in the areas in question. The Harlequin Duck, also found in the area, is listed by COSEWIC as a species of Special Concern. Migratory birds, including marine birds, are also protected pursuant to the *Migratory Birds Convention Act*. Concern about the potential impacts of oil and gas development on sea birds was particularly raised by the submission of Environment Canada to the Public Review.

Concern

- Deep diving species, such as Murres and Dovekies could be affected by seismic.

Advice of the Science Review Working Group

- The SRWG expresses with ***confidence*** (see definition on page 12) that any effects to sea birds are expected at the individual level, rather than the population level. The SRWG notes that mitigation measures for other species might benefit sea birds but they did not specify which measures might be helpful.

Consensus

- The Ad Hoc Working Group accepts the advice of the SRWG that any potential impacts of seismic testing on sea birds would likely be at the individual level.
- The Ad Hoc Working Group reached consensus that the impacts of seismic on sea birds would not be a significant environmental concern.

Other Information for Consideration

- The CNSOPB is working with Environment Canada to develop protocols for marine bird observation and monitoring.

Recommendation

The CNSOPB should ensure that close attention is given to the protection of sea birds should any further development of oil and gas proceed in the sensitive areas of coastal Cape Breton.

5.3.7 Issue – Potential Risks to Marine Mammals

Whales

There are at least fifteen species of cetaceans that are found in the licence areas in question. Six of these are found frequently – fin, minke, humpback, pilot whales, white-sided dolphin and harbour porpoise. Of great concern is the possible impact on the rarest species of whales, blue and right whales, both of which are classed as Endangered by the COSEWIC. Whales have a highly sophisticated sound dependent communication system and are very sensitive to loud noise.

Concern

- Whales may be impacted by seismic, affecting their hearing, impacting on their migration and other behaviours.
- Fishermen on the Ad Hoc Working Group from both coasts report whales being present in and near the licence areas through December and into January. The evidence of fishermen is that whales will remain as long as herring is present.
- Due to the status of the blue and right whales as Endangered, concern exits for the individual animal, not merely effects at the population level.
- Small toothed whales and dolphins may be feeding at the time of the surveys and this feeding behaviour may be disrupted.

Advice of the Science Review Working Group

- The SRWG ***predicts*** (see definition on page 12) that with the proposed mitigation measures that behavioural avoidance would protect marine mammals from hearing loss. They also ***predict*** (see definition on page 12) that there would be displacement of any remaining whale migration to avoid seismic sound but that this displacement is not expected to be critical. The SRWG did not analyse the impacts to whales on a species by species basis. The SRWG did note that by late October most of the large whales are no longer in the Southern Gulf, although pilot whales may remain. The SRWG made no comment about the presence of large whales in the late fall in Sydney Bight. Other than these comments about large whales, which would include the species of greatest concern, the SRWG makes no species-specific observations. In order to minimize impacts on whales if seismic testing were to take place, the SRWG recommends additional measures, including the presence of trained biological observers to act as whale spotters on board the vessel. Should any whales be spotted within 1km of the vessel, the SRWG recommends that testing be shut down.

Consensus

- The protection of the individual members of the blue and right whales populations is a serious concern.

Other Information for Consideration

- With the recent passage and Royal Assent to the federal *Species at Risk Act*, it is not merely population health that must be considered. Under federal law, the impact on each individual endangered whale is now a concern. Under the *Species at Risk Act*, it is illegal to harass or kill an individual within a species classified as endangered.
- The recommendation of the SRWG to stop seismic testing if whales are spotted within 1km of the seismic vessel raises issues regarding adequate visibility, for example, seismic testing at night. The Ad Hoc Working Group has acknowledged that limiting seismic to daylight hours and conditions of good visibility is difficult from both a practical and financial perspective. There are number of options which may adequately address this issue, including waiting for conditions of good visibility to re-start the guns if for some reason they are required to stop in conditions of poor visibility. These options should be considered and discussed by the CNSOPB, the Department of Fisheries and Oceans, Environment Canada and the operators.

Recommendation

If the seismic activities are to proceed, a protocol to minimize the risks to whales at night or during other conditions of reduced visibility should be developed by the CNSOPB in conjunction with the Department of Fisheries and Oceans and Environment Canada.

Seals

Grey and harbour seals are known to be present in the licence areas and will be feeding at the survey times.

Concern

- The feeding of seals may be affected.

Advice from the Science Review Working Group

- The SRWG notes that seals are less sensitive to sound than whales and ***predicts*** (see definition on page 12) that there would be very little redistribution of feeding effort.

Consensus

- The Ad Hoc Working Group agrees with the SRWG that seals are less sensitive to sound than whales and that very little redistribution of feeding effort would be expected to occur. In addition, the group recognizes that seal populations are robust and experiencing population growth. For these reasons, the Ad Hoc Working Group agrees that seals are unlikely to experience any significant negative impacts from the proposed activities.

5.3.8 Issue – Potential Risks to Protected Areas

In addition to the protected wildlife areas noted in the section on sea birds, the licence areas are within close proximity of the Cape Breton Highlands National Park.

Concern
- There may be a potential risk to protected areas from future oil and gas development.

Advice from the Science Review Working Group
- The SRGW did not provide any advice in relation to protected areas.

Consensus
- The seismic testing operations currently under review would not affect the national park.
- The Ad Hoc Working Group did not make a consensus recommendation on the issue of protected areas, as the concern is primarily one for any potential future development activity.

Other Information for Consideration
- Under the U.N. Convention for the Protection of Biological Diversity, as well as the recently amended *National Parks Acts,* activities that have a negative impact on the park are a concern.
- The Heritage River programme, including the Margaree River, is also within the Department of Heritage's mandate.
- The Department of Fisheries and Oceans is currently reviewing the area of Basin Head, PEI, as an Area of Interest under the *Oceans Act* and it may be declared a marine protected area in the future.

Recommendation

The CNSOPB should consult with the federal Department of Heritage, the Parks Canada Agency, and the Department of Fisheries and Oceans and Environment Canada prior to future developments taking place.

5.3.9 Issue – Potential Risks to the Cape Breton Tourism Industry

The tourism industry is an important contributor to the Cape Breton Island economy. Cape Breton tourism is highly dependant on the natural environmental features and traditional and cultural values of the area.

Concerns
- Oil and gas activities could compromise tourism values.
- The risk to whale watching companies is that whales may not return for the next season.

Advice from the Science Review Working Group

- The SRWG notes that ecotourism and other human uses of the seismic survey areas are limited at the proposed survey times and that the direct impact is expected to be negligible. The SRWG indicates that indirect impacts, such as effects on whale watching, have been addressed in under specific issues in section 4.2 of the Science Review.

Consensus

- In general, the Ad Hoc Working Group agrees with the SRWG that tourism is limited at the time of the proposed survey; however, some members have indicated that October (which is within the time periods proposed) is an important month for tourism in Cape Breton. The Ad Hoc Working Group has agreed that by late October, seismic activities are expected to have a minimal direct impact on tourism.

Other Information for Consideration

- Ecological values and pristine environmental conditions are important for tourism and should be given consideration.
- If future exploration and development should occur, developments would be expected to be approximately 30km offshore. This distance would reduce potential impacts to the tourism industry.
- Future exploration and development may have an impact on whales and seabirds. Reviews and authorizations for future oil and gas activities must address this concern.

5.3.10 Issue – Potential Risks from Munitions

The Ad Hoc Working Group spent a great deal of time reviewing the issue of environmental threats from offshore dumping of munitions and chemical/biological weapons in and adjacent to the licence areas in question. The Ad Hoc Working Group notes with appreciation the work of local concerned citizens, particularly Mr. Myles Kehoe and Dr. Michael Ojoleck, whose efforts contributed to the establishment of a $10 million federal program within the Department of National Defence and an interdepartmental committee within the federal government to address the issues. This is an important and long over-due evaluation of these dumps off our coasts.

Concern

- Seismic exploration will disturb or damage munitions and/or chemical/biological weapons that may have been dumped in the survey areas.

Advice from the Science Review Working Group

- The SRWG reached consensus that there is a low likelihood of seismic affecting munitions, due to low energies reaching the sea floor at the water depths involved and that the risk to the environment and human safety was greater through bottom interactions with munitions. The SRWG concludes that additional measures by the CNSOPB are not necessary.

Consensus

- The Ad Hoc Working Group reached consensus that the issue of offshore munitions and chemical dumping from military activities is of national and international significance.
- The Ad Hoc Working Group accepts the consensus statement of the SRWG that there is a very low likelihood of seismic exploration affecting old munitions, due to the low energies reaching the sea bed at the water depths involved. However, the group recognizes that the Department of National Defence presentation to the Ad Hoc Working Group (September 18, 2002) indicated that seismic testing over munitions was an additional risk at some level.
- The Ad Hoc Working Group agrees that any physical interference with dumps containing munitions, chemical warfare agents and unexploded ordnances could be a significant concern. It is expected that CNSOPB would continue with the standard requirement of conducting routine hazards site surveys for any exploratory or development activities that make contact with the sea floor and that this would address this issue.
- The Ad Hoc Working Group agrees that munitions sites represent a significant additional risk factor to physical activities, such as trawling, exploratory drilling and any other activities which might result in disruption or detonation of stored materials. The group accepted the SRWG's advice that, on balance, the potential for seismic to result in an additional risk of disruption of toxic materials, or detonation of munitions is quite small. However, in the event that any activities involving physical disruption of the site are ever considered, the presence of these offshore dumps is a serious problem that needs to be addressed and mitigated.

Recommendations

The Ad Hoc Working Group agrees with the consensus statement of the SRWG that there is a very low likelihood of seismic exploration affecting old munitions. The CNSOPB should support the initiative of the Department of National Defence to ensure that the review and mapping of sites is thorough and, where appropriate, that clean up of these sites is addressed. The CNSOPB should continue the requirement of conducting routine hazards site surveys for exploratory or development activities that make contact with the sea floor.

5.3.11 Issue – Potential Risks to First Nations

The Mi'kmaq of Nova Scotia, including the five Bands/First Nations on Cape Breton Island, assert Aboriginal and treaty rights to harvest marine resources in the subject area, for their food and livelihood purposes. They also assert Aboriginal title rights to the seabed and superjacent water column that would relate to the use of that space. Treaty rights and Aboriginal rights, including Aboriginal title are constitutionally protected by section 35 of the Constitution Act, 1982.

Concern

- Any adverse environmental impacts would infringe upon any Aboriginal, treaty, and Aboriginal title rights that the First Nations have.

Views of First Nations

- Some Cape Breton bands have agreements and licences with the Department of Fisheries and Oceans that give them rights of access to fisheries resources in the subject areas.
- The federal and provincial Crowns, namely, Her Majesty the Queen in Right of Canada and Her Majesty the Queen in Right of Nova Scotia, each have a duty to consult with the Mi'kmaq of Nova Scotia over the exploration and testing for oil and gas resources in areas subject to Aboriginal, treaty, and Aboriginal title rights. There is disagreement over when that duty to consult arises and whether the duty has been met here. The Mi'kmaq of Nova Scotia believe the duty arises before there is an actual infringement, at the time when an activity is proposed that might impact upon their Aboriginal, treaty or Aboriginal title rights. The Mi'kmaq of Nova Scotia believe the proposed exploration and testing activities might impact upon their rights and that the duty to consult has arisen here. The Mi'kmaq of Nova Scotia believe the duty to consult owed to them by the Crowns has not been fulfilled here, for the projects in question.
- The failure of the Crowns to consult, as well as any actual, unjustified infringement of Aboriginal, treaty, or Aboriginal title rights, might give rise to legal proceedings. These proceedings could affect both Crowns and the project proponents. There is thus a risk that litigation could result.
- The Mi'kmaq of Nova Scotia do not accept the Ad Hoc Working Group as a means of consultation by the Crowns. The Mi'kmaq believe consultation must be directly between the two Crowns and the Mi'kmaq.

Consensus among the Ad Hoc Working Group representatives for First Nations and the federal and provincial governments

- The CNSOPB should ask the First Nations and the Crowns to advise them of any discussions that they have undertaken, prior to the final authorization of the activities.

5.3.12 Issue – Future Exploration and Development

Seismic testing indicating hydrocarbon potential often leads to exploratory drilling or additional seismic testing to determine drilling locations. Exploratory drilling, which involves the use of a drilling platform for approximately one to three months, can lead to a significant discovery. The likelihood of making such a discovery is in the order of 1-in-10 and could lead to long term development of the resource.

Concerns

- Seismic exploration may lead to further exploration and development in the licence areas.
- Further exploration and development in the licence areas may lead to potential negative effects that cannot be adequately considered at this time.
- Further exploration and development beyond the current applications could lead to additional risks, including cumulative effects.
- Additional seismic may be required throughout the life of the project, possibly creating a risk of long term exposure to seismic sound.
- Future exploratory drilling and development could lead to the destruction of benthic habitat from the distribution of cuttings and drilling muds.
- Any further oil and gas activity in the area could have significant impacts on fish, particularly should spills and blowouts create contamination of their waters.

Advice from the Science Review Working Group

- The SRWG was unable to comment on the potential impacts from future exploration.

Consensus

- The Ad Hoc Working Group acknowledges that further exploration and development could involve the distribution of cuttings and drilling muds. Cuttings and muds, if deposited into the water, could have potentially adverse environmental impacts.

Other Information for Consideration

- If a discovery is made, it is likely to be sweet gas. If oil or sour gas is discovered it would change the assessment of potential impacts.
- If seismic activities proceed and applications for drilling activities are made, the Ad Hoc Working Group notes the assurances given by the proponents during the Cape Breton Review on proposed mitigation measures. The licence-holder-members of the Ad Hoc Working Group confirm their commitment to these measures. In the case of the Corridor Resources Inc. licence area, these commitments include:
    - Elimination of any discharges, including drill cuttings during drilling and/or production operations that are deemed by the regulatory authorities to be potentially harmful to invertebrates or to the crab fishery (e.g. zero discharge of drilling mud, cuttings and produced fluids in such circumstances).
    - Compensation for economic loss incurred by the Area 18 and Area 19 crab fishermen where loss of access to traditional crab fishing grounds occurs due to exploration and/or development activities within the area represented by EL 2368. Prior to seeking approval from the CNSOPB to drill a well within EL 2368, Corridor Resources Inc. will make all reasonable efforts to negotiate and execute a "loss of access" compensation agreement with the Area 18 and Area 19 crab fishermen detailing the specifics of such an agreement.
- The Ad Hoc Working Group also notes that current technology exists to develop nearshore (15-30 km) gas deposits on a subsea basis.

- Additional scientific research would help to clarify the potential risks of exploratory drilling and development and reduce uncertainties related to the potential impacts on marine life.

Recommendations

Although the potential negative effects from further exploration cannot be adequately considered at this time (until details of the activities are known), the **CNSOPB** should address and mitigate potential impacts from the following at the time future applications are considered:

- Physical smothering of marine organisms with drilling muds and cuttings
- Toxic contamination of the ecosystem due to contaminants in drilling muds
- Physical impacts of drilling (munitions, displacement of marine life)
- Physical displacement of the fishery
- Potential loss of income to fisheries and tourism
- Produced water disposal
- Pipeline installation
- Spills, blowouts and accidents

The **CNSOPB** should consider placing a condition on approvals for any future developments (resulting from the current licence areas) that would eliminate any discharges that, in the opinion of the regulatory authorities, may be harmful to invertebrates and other important species.

5.1.11 Issue – Potential Risk of Other Environmental (Cumulative) Effects

An ecosystem is defined as a biological community of interacting organisms and their surrounding environment. Ecosystems are extraordinarily complex and difficult to understand, even in the case of well-studied systems.

The environment cannot be understood by simply totalling environmental impacts on different species. There are complex interactions, many other species (often ignored are those species with no immediate commercial value), and, more fundamentally, the environment is impacted by more than one thing at a time. The Ad Hoc Working Group noted that in this report judgements have been made about which species are most important. There has been no attempt to catalogue impacts to every species within the ecosystem. It is the *'ecosystem effects'* which this section attempts to address.

In the context of highly significant species, such as cod, Atlantic salmon or hake, or to species at risk of extinction, such as the blue whale, right whale and leatherback turtle, the question of seismic testing cannot be judged in a vacuum.

An ecosystem effect can be described as a change or changes in an ecosystem over time triggered by changes (natural or human induced) to one or more ecosystem components.

Factors contributing to ecosystem effects: historic over-fishing, land-based sources of marine pollution, marine pollution, increased UV with potentially large impacts on food sources such as capelin, impacts of climate change (which in the East Coast context has generally led to colder waters due to the action of the Labrador Current and to a lesser extent melting arctic ice), and predation by other species.

Concern

- Ecosystem or cumulative effects will adversely affect the environment and/or individual species within that environment.

Advice from the Science Review Working Group

- The SRWG indicated that there is evidence of long term ecosystem impacts and that the degree to which the proposed activities would add to this effect is currently unknown. The scientists also noted that at the time of the proposed surveys there are few other conflicting activities occurring in the area, but many other stresses are continuous. The Science Review states that the issue of seismic impacts on any particular species could not be viewed in isolation from the rest of the environment. The report also notes in its conclusions that 'the most critical issues are uncertainties regarding impacts to snow crab, risks to finfish, and *ecosystem effects*, such as the additional effect of seismic on the existing natural and human induced factors impacting cod populations.'

Consensus

- In viewing the environmental risks and larger cumulative impact of human activity on the ecosystem, the Ad Hoc Working Group reached consensus that there are risks from seismic testing to various species; the risk is judged to be low in most cases and unknown in others. There is no window of opportunity in the time identified by Hunt Oil Company and Corridor Resources Inc. for seismic when the risk is totally eliminated.

Recommendation

In balancing the potential risks of cumulative effects against the potential benefits from oil and gas development, the Ad Hoc Working Group agreed that the following views were held:

- Some members felt the risks were low and acceptable in light of the possible benefit (oil and gas drilling and development) and that cumulative effects risks could be mitigated and addressed through enhanced monitoring and research efforts.
- Some members believed the risks to be unacceptable and that any activity posing additional risks to many significant species was not acceptable, particularly when the 'benefit' (oil and gas drilling and development), in fact, may pose greater risks to the same resources.

5.4 POTENTIAL BENEFITS

5.4.1 Issue – Potential Benefits to Tourism, Hospitality, and Recreation

Economic prosperity is important in Nova Scotia, particularly Cape Breton. The tourism, hospitality, and recreation industries rely not only on visitors to Nova Scotia but also on the activities of the families and individuals who live and/or work in our Province.

Consensus
- There are no significant benefits to tourism from seismic activities.

Other Information for Consideration
- Future activities may benefit the tourism industry. The specifics of these benefits cannot be assessed at this time.
- If future exploration and development occurs in a carefully planned and an environmentally sensitive manner, there may be increased prosperity for Cape Bretoners, with possible spin-offs to tourism, hospitality and recreation.

5.4.2 Issue – Defining Resource Potential

The acquisition of seismic data defines the potential for resource development by creating a picture of the geological features below the sea floor. This information is of value to the public and private sector, as it allows for an estimation of the scope of the resource and for the identification of potential drilling locations. By setting the stage for future developments, collecting seismic information becomes the foundation for other benefits later on.

Potential Benefits
- Defining the resource potential allows for public sector planning and policy development.
- Quantifying the resource potential allows the private and public sectors to better assess whether additional investment is warranted.
- An effective seismic program may set precedence for investment in other offshore activities.

Consensus
- There is a benefit to policy makers from defining the resource potential.

Other Information for Consideration
- Increased knowledge of the resource potential may increase investment potential.

5.4.3 Issue – Potential Direct Economic Benefits

Direct economic benefits consist of the benefits that result directly from the activities taking place, in this case the seismic testing.

Concern
- An over-stating of environmental risks could mask the potential benefits of oil and gas development.

Potential Benefits (from seismic only)
- Likely contracting of east coast seismic vessel.
- Short term employment as observers or crew on vessels (including chase vessels).
- EEM or research programs could create additional employment opportunities (boats, crew, and consultants).
- Potential development of research opportunities and acquisition of research funds, particularly in Cape Breton.

Consensus
- Although there are few economic benefits from seismic, the Ad Hoc Working Group agrees that there is potential for greater economic benefits if further exploration and development occurs.

5.4.4 Issue – Potential Economic Benefits if Further Exploration and Development Occur

The proposed seismic programs are primarily aimed at confirming existing data and precisely identifying potential drilling locations. If exploratory drilling proceeds and eventually leads to a commercially significant discovery, substantial economic benefits can be expected.

Concern
- An over-stating of environmental risks could mask the potential benefits of oil and gas development.
- If there were negative impacts to fisheries and tourism arising from these activities the Cape Breton economy may be affected.

Potential Benefits
- Business opportunities in supply and service
- Increased business opportunities in recreation and hospitality industries
- Development of onshore facilities (e.g. gas plant and supply base)
- Local gas availability and consumption
- Direct crew employment on the supply boats and rig
- Direct employment in supply and service
- Increased tax base

- Positive economic outlooks within industrial communities
- Possible long-term economic benefits and economic diversification for Cape Breton
- A timely discovery increases the likelihood that a resulting supply base and infrastructure could be located in Cape Breton.
- The development of an EEM research centre at the University College of Cape Breton (UCCB). The Cape Breton Growth Fund has indicated support for developing an EEM research centre at UCCB.

Consensus

- If development is planned and executed carefully, and is sensitive to other Cape Breton interests it could have a positive economic benefit for Cape Breton.

Recommendation

If the activities are to proceed and the prospects for future exploration and development look favourable, the Ad Hoc Working Group recommends that serious consideration be given to the planning and development of an EEM research centre at the University College of Cape Breton.

5.4.5 Issue – Potential Environmental Benefits

Natural gas is a clean burning fuel with fewer pollutants than other fossil fuels.

Potential Benefits

- Development of natural gas could bring increased natural gas use to Nova Scotia thereby reducing the volume of air borne pollutants.
- A reduction in tanker traffic could be associated with increased use of natural gas, subsequently reducing the potential for spills.

Consensus

- The Ad Hoc Working Group is supportive of the use of cleaner burning fuels and of initiatives that would reduce the potential for spills.

5.4.6 Issue – Potential Benefits to First Nations

Potential Benefits

- The seismic programs proposed are unlikely to provide benefits to the Mi'kmaq of Nova Scotia without an agreement with the proponents. At present there is no such benefits agreement.

5.5 OTHER CONSIDERATIONS

5.5.1 Proposed Mitigation Measures

Hunt Oil Company and Corridor Resources Inc. proposed a number of mitigation measures in their Environmental Impact Assessments (EIAs). The mitigation measures, as proposed, are intended to reduce the potential negative impacts to a number of species. The SRWG outlined a number of important mitigation measures, which are presented below. For a complete list of mitigation measures proposed by each operator please refer to their EIAs.

Concerns

- That the mitigation measures will not be effective in reducing potential negative impacts, particularly the measure of seasonal optimisation and timing.
- The mitigation measures will trigger the *Species at Risk Act*.

Advice from the Science Review Working Group

- The SRWG assumed that the operators would be willing to take, if necessary, the following mitigation measures:
    - Seasonal optimisation to minimize potential effects on sensitive life stages and interference with fishing;
    - 'Ramping up' procedures to incrementally increase power to the air gun array over 30 minutes thereby encouraging animals to leave the operating area prior to commencement of surveys;
    - Retaining trained biological observers on board vessels;
    - Deployment of guard boats to intercept other marine traffic;
    - Shutting down seismic operations when whales are found to be within 1km of the seismic vessel;
    - Consulting with fishermen and First Nations; and
    - Providing financial compensation for damage to fishing gear.
- In the case that the seismic activities proceed, the SRWG concluded that it would be necessary to implement all mitigation measures listed within the Science Review and that minimal levels of sound output are used to obtain the required geological data. The scientists indicated that the mitigation measures should reduce population level effects on marine mammals and turtles to negligible levels and reduce, but not eliminate, the risks to other resources and the receiving environment.

Consensus

- Some members of the Ad Hoc Working Group agree with the Department of Fisheries and Oceans that conducting the seismic activities in December or January would create less risk to most species than conducting programs in October or November. Some members accept that data acquisition at the later dates could be more costly and less valuable and could lead to errors in exploratory decision-making.

- Some do not feel that the mitigation measures will adequately address the concern of risks to certain species. Some members believe that the mitigation measures do address these risks.

Recommendation

All members agree that, if the activities do proceed, that the implementation of the mitigation measures outlined in the Science Review is vitally important.

5.5.2 Environmental Effects Monitoring (EEM)

In the oil and gas industry, EEM is used to determine the changes over time that occur to a specified environmental component when a specified industrial component is introduced. EEM is important in determining potential impacts on environmental components and is used to modify and guide future developments.

Advice from the Science Review Working Group

- The SRWG recommends that although EEM is not normally required for seismic programs that, given the inshore nature of the projects and the lack of EEM relating to seismic, EEM should be required if the projects proceed. The scientists suggest incorporating some measure of received sound levels and that the programs should be developed in a cooperative manner.

Consensus

- The Ad Hoc Working Group agrees with the SRWG that there is a lack of EEM programs demonstrating the effects of seismic on marine species.
- Implementing EEMs could increase our understanding of the effects of seismic.
- The Ad Hoc Working Group agrees with the SRWG that EEM is particularly important in this nearshore area.
- Validating models of sound in shallow waters, effects of seismic on crab, and the effects on other species are important.

Recommendations

The Ad Hoc Working Group supports all efforts to gain better scientific information on the effects of oil and gas activities on the ocean environment including work to establish an EEM Centre at the University College of Cape Breton.

If activities proceed then there is a strong recommendation for EEM programs to be developed, particularly for snow crab. These programs should be developed cooperatively and the proponents should seek funding from other sources. Although gaining an understanding of potential impacts is important, it cannot be used as the primary reason for carrying out seismic activities.

5.5.3 Further Studies

Additional knowledge on the propagation of seismic sound and the effects of seismic on marine ecosystems would be valuable. Studies specific to offshore Nova Scotia and specific to Atlantic species are limited. The Environmental Studies Research Fund (ESRF) is a primary funding source for studies relating to oil and gas.

Consensus

- Developing an understanding of physiological and behavioural responses of valued species to seismic is important.
- Conducting further studies could increase our understanding of the propagation of seismic sound and the effects of seismic on marine ecosystems.

Recommendation

The Ad Hoc Working Group recognizes the need for further studies on the impacts of oil and gas development on the environment and encourages these studies. Although gaining an understanding of potential impacts is important, it cannot be used as the primary reason for carrying out seismic activities.

5.5.4 Liability/Compensation/Insurance

Any person wishing to conduct any work or activity in Nova Scotia offshore area must first provide proof of financial responsibility in a form and amount satisfactory to the CNSOPB. The basic objectives of proof of financial responsibility are:

- Providing financial compensation to any party respecting claims attributable to the work or activity. Eligible claims would include those relating to loss of or damage to property, financial loss, or injury/death;
- Restoring and preserving of the physical environment, including the seabed; and
- Ensuring that the operator will properly terminate the authorized work or activity, having regard to environmental, safety, and other concerns.

The form in which evidence of financial responsibility may be submitted includes, but is not limited to:

- Insurance;
- Audited financial statements;
- Corporate guarantee from a third party, including an affiliate; or
- Letter of credit or indemnity bond.

Concerns

- Compensation for economic loss from the fishery.
- Liability, compensation and insurance for environmental damages.

Other Information for Consideration

- In addition, the Canadian Association of Petroleum Producers is developing two programs through which the commercial fisheries industry may apply for compensation for damage to gear or vessels caused by oil and gas activities, as an alternative to making claims through the courts. Each program is designed to offer similar compensation packages with the principle differences being whether the damage as a result of a known (attributable program) or unknown (unattributable program) upstream oil and gas operator. These programs cover loss of, or damage to fishing vessels and fishing or aqua-culture gear; including repairing, cleaning or replacing fishing gear or vessels, as well as towing, dry-docking charges, the cost of renting a substitute vessel, and compensation for lost income resulting from a damaged vessel and lost or damaged gear. These programs do not cover loss of life or personal injury, nor does it cover losses sustained as a result of the vessel being in a designated or statutory safety zone.

Consensus

- Guidelines for financial responsibility as presented through the existing *Accord* legislation (facilitated by industry sponsored compensation programs) provides sufficient protection to fisheries vessels and equipment. If there is long term damage to fisheries and the environment or short term immediate reductions in catch, compensation remains a complex question.

6.0 RECOMMENDATIONS AND CONCLUSIONS

Coming to conclusions and making recommendations on whether or not the CNSOPB should authorize the proposed activities requires an understanding of both the potential risks and potential benefits associated with the activities, the balancing of legitimate and competing interests and rights, and related value judgements. As discussed earlier, the comparison of risks versus benefits is complicated, as the risks and benefits often impact different sectors and individuals.

6.1 ISSUE SPECIFIC RECOMMENDATIONS

Specific recommendations are provided below for several of the issues discussed in section 5.0 of this report. Each of these recommendations should be given fair and equal consideration in the CNSOPB decision-making process related to whether or not the proposed activities in the licence areas off the coast of Cape Breton will be authorized to proceed.

6.1.1 Invertebrates

Snow crab

In balancing the potential risks to crab with the potential benefits of oil and gas development, the Ad Hoc Working Group agreed that the following views were held:

- Some members believe that there is adequate knowledge to make a decision on whether the activities should proceed. This belief is based upon the ***preliminary judgement*** (see definition on page 12) of the SRWG is that there would be no perceptible negative impact on snow crab populations; that preliminary results of the ESRF crab study are consistent with this judgement and that mitigative measures would adequately reduce these risks. Furthermore, these members know of no evidence world wide that indicates any adverse effects to crustaceans from the millions of kilometres of seismic conducted elsewhere.
- Some members believe that not enough is known about the effects of seismic on snow crab for the seismic activities to proceed, nor that the proposed mitigation measures would adequately reduce the potential risk.
- Some members believe that not enough is known about the potential effects of oil and gas exploration and development on snow crab for the activities to proceed. These members believe that the applications to conduct seismic should be rejected, that the prohibition of activities on the licence areas should be extended, and that a moratorium should be placed on oil and gas exploration on the inshore waters of Cape Breton Island. The members believe that these measures should remain in place until adequate science has been conducted and adequate mitigation measures for exploration and development procedures have been assured by the proponents.

The SRWG recommended that CNSOPB wait for the results of the ESRF crab study before making a decision on the significance of impacts of the proposed activities to crab. The Ad Hoc Working Group acknowledges this recommendation and the following views held by members relating to this recommendation:

- Some members believe the ESRF study needs to be reviewed by other scientists and people in the fishing and oil and gas industry before the results could be considered finalized. These members also believe that this recommendation would preclude any decision on seismic until this work is finalized.
- Some members believe that this recommendation would allow the CNSOPB to make a decision now on whether or not the proposed activities should proceed based on currently available knowledge with respect to snow crab, and if the activities are approved, the CNSOPB should consider the results of the ESRF crab study in the design of mitigation plans.

Lobster

In balancing the potential risks to lobster with the potential benefits of oil and gas development, the Ad Hoc Working Group agreed that the following views were held:

- Some members believe that there is adequate knowledge to make a decision on whether the activities should proceed. This belief is based upon the ***preliminary judgement*** (see definition on page 12) of the SRWG that indicates that there would be no perceptible negative impact on snow crab populations; that preliminary results of the ESRF crab study are consistent with this judgement; that snow crab serves as an adequate model for lobster; and that mitigative measures would adequately reduce these risks. Furthermore, these members know of no evidence world wide that indicates any adverse effects to crustaceans from the millions of kilometres of seismic conducted elsewhere.
- Some members believe that not enough is known about the effects of seismic on lobster for the seismic activities to proceed, nor that the proposed mitigation measures would adequately reduce the potential risk.

The results of the ESRF crab study should be reviewed (through the means suggested in the section on snow crab) and, where appropriate, applied to lobster.

The Ad Hoc Working Group encourages the development of studies to verify whether the extrapolation of results from crab studies to lobster is accurate. If the activities proceed, the proposed activities should be used as opportunities for such studies. However, the Ad Hoc Working Group has recognized that although gaining an understanding of the potential impacts is important, it cannot be used as the primary reason for seismic testing.

6.1.2 Fish

Cod

In balancing the potential risks to cod against the potential benefits of oil and gas development, the Ad Hoc Working Group agreed that the following views were held:

- Some members felt the risk to cod stocks was acceptable given: the small scale of the seismic surveys; the low risk of harm to the cod population; the mitigation measures proposed; and the recommendation of the SRWG for EEM.
- Some members of the Ad Hoc Working Group disagreed and felt that: there was no period which eliminated the risks to cod in either area; the seismic program in Sydney Bight was large in relation to the cod population; and viewed any additional risk to either cod population as unacceptable. These members do not accept that the mitigation measures are sufficient to protect cod.

If the seismic activity is to proceed, the CNSOPB, in consultation with DFO should consider ways to minimize risks to cod.

White hake

In balancing the potential risks to white hake against the potential benefits of oil and gas development, the Ad Hoc Working Group agreed that the following views were held:

- Some members of the group felt the risk to white hake stocks was acceptable.
- Some members of the Ad Hoc Working Group disagreed and viewed any additional risk to the precarious white hake population as unacceptable.

Herring

In balancing the potential risks to herring against the potential benefits of oil and gas development, the Ad Hoc Working Group agreed that the following views were held:

- Some members felt the risk to herring stocks was acceptable given: the small scale of the seismic surveys; the low risk of harm to the herring populations; the mitigation measures proposed; and the recommendation of the SRWG for EEM.
- Some members of the Ad Hoc Working Group disagreed and believe that the risks to the depleted Bras d'Or herring stock would be unacceptable if the seismic activities were run within 50km of Bird Islands.

All members of the Ad Hoc Working Group agree that, if seismic activities proceed, the CNSOPB should consider the use of herring spawning areas in the development of a model of the propagation of sound along critical paths to determine mitigation measures required. Consideration should be given to the validation of models prior to conducting seismic activities. This validation should take place early enough for regulatory bodies to act or for operators to make realistic adjustments to pre-defined scales.

Atlantic salmon

In balancing the risks to Atlantic salmon in Cape Breton salmon bearing rivers against the potential benefits of oil and gas development, the Ad Hoc Working Group agreed that the following views were held:

- Some members of the group felt confident that the SRWG advice, including advice that due to the short duration of the survey and the low power of the airguns, this risk is ***judged*** (see definition on page 12) to be very low in the Gulf and should provide adequate assurance to the Board to allow the testing to take place.
- Some members of the Ad Hoc Working Group viewed the additional risk to a salmon population was unwarranted. The level of concern about the risk was influenced by the question of timing as all members of the Ad Hoc Working Group agreed with the SRWG that any risks to spawning run salmon would be almost completely eliminated by conducting seismic surveys after November 1. This is not a mitgation measure for those salmon spending their first year at sea.

If seismic activities are to proceed, the CNSOPB should ensure that potential effects on salmon are adequately mitigated. The Atlantic Salmon Federation has indicated a willingness to work with the CNSOPB to ensure that potential impacts to salmon are reduced.

Bluefin tuna

Given the lack of published literature on tuna, the Ad Hoc Working Group encourages the CNSOPB to be supportive of research studies relating to the effects of oil and gas development on tuna.

Mackerel

If the activities proceed, the CNSOPB should consult with the Department of Fisheries and Oceans to determine the timing of mackerel migration.

6.1.3 Fisheries and Scientific Fish Surveys

The CNSOPB should continue to implement current processes for addressing potential conflicts with fisheries and scientific fish surveys.

If the seismic activities proceed, some members recommend that the activities in Sydney Bight be conducted after November 1, 2003 to eliminate potential risks to the Glace Bay herring fishery.

6.1.4 Leatherback Turtles

The Ad Hoc Working Group members agree that the CNSOPB should consult with the Department of Fisheries and Oceans, Environment Canada and scientists within the N.S. Leatherback Turtle Working Group, to ensure that the recovery of the leatherback turtle is not compromised.

6.1.5 Sea Associated Birds

The CNSOPB should ensure that close attention is given to the protection of sea birds should any further development of oil and gas proceed in the sensitive areas of coastal Cape Breton.

6.1.6 Whales

If the seismic activities are to proceed, a protocol to minimize the risks to whales at night or during other conditions of reduced visibility should be developed by the CNSOPB in conjunction with the Department of Fisheries and Oceans and Environment Canada.

6.1.7 Protected Areas

The CNSOPB should consult with the federal Department of Heritage, the Parks Canada Agency, and the Department of Fisheries and Oceans and Environment Canada prior to future developments taking place.

6.1.8 Munitions

The Ad Hoc Working Group agrees with the consensus statement of the SRWG that there is a very low likelihood of seismic exploration affecting old munitions. The CNSOPB should support the initiative of the Department of National Defence to ensure that the review and mapping of sites is thorough and, where appropriate, that clean up of these sites is addressed. The CNSOPB should continue the requirement of conducting routine hazards site surveys for exploratory or development activities that make contact with the sea floor.

6.1.9 Future Exploration and Development

Although the potential environmental effects from further exploration cannot be adequately considered at this time (until details of the activities are known), the CNSOPB should address and mitigate potential impacts from the following at the time future applications are considered:

- Physical smothering of marine organisms with drilling muds and cuttings
- Toxic contamination of the ecosystem due to contaminants in drilling muds
- Physical impacts of drilling (munitions, displacement of marine life)
- Physical displacement of the fishery
- Potential loss of income to fisheries and tourism
- Produced water disposal
- Pipeline installation
- Spills, blowouts and accidents

The CNSOPB should consider placing a condition on approvals for any future developments (resulting from the current licence areas) would eliminate any discharges that, in the opinion of the regulatory authorities may be harmful to invertebrates and other important species.

6.1.10 Cumulative Effects

In balancing the potential risks of cumulative effects against the potential benefits from oil and gas development, the Ad Hoc Working Group agreed that the following views were held:

- Some members felt the risks were low and acceptable in light of the possible benefit (oil and gas drilling and development) and that cumulative effects risks could be mitigated and addressed through enhanced monitoring and research efforts
- Some members believed the risks to be unacceptable and that any activity posing additional risks to many significant species was not acceptable, particularly when the 'benefit' (oil and gas drilling and development), in fact, may pose greater risks to the same resources.

6.1.11 Economic Benefits for Cape Breton

Cape Breton needs to explore a variety of economic activities to help improve the economy. Depending upon the outcome, oil and gas development off of Cape Breton could result in substantial economic benefits to the area. (If there were negative impacts to fisheries and tourism arising from these activities the Cape Breton economy may be affected.)

If exploration activities proceed and lead to proposals for development from the three licence areas off the coast of Cape Breton, the regulatory approval process should take into account the requirements for economic development and diversification as well as preservation of traditional industries in Cape Breton in the design of such projects. The CNSOPB should also require Benefit Plans to outline the expected local impact on Cape Breton as well as the rest of Nova Scotia and Canada.

6.1.12 Mitigation Measures

All members agree that, if the activities do proceed, that the implementation of the mitigation measures outlined in the Science Review is vitally important.

6.1.13 Environmental Effects Monitoring (EEM)

The Ad Hoc Working Group supports all efforts to gain better scientific information on the effects of oil and gas activities on the ocean environment including work to establish an EEM Centre at the University College of Cape Breton.

If activities proceed then there is a strong recommendation for EEM programs to be developed, particularly for snow crab. These programs should be developed cooperatively and the proponents should seek funding from other sources. Although gaining an understanding of potential impacts is important, it cannot be used as the primary reason for carrying out seismic activities.

6.1.14 Further Studies

The Ad Hoc Working Group recognizes the need for further studies on the impacts of oil and gas development on the environment and encourages these studies. Although gaining an understanding of potential impacts is important, it cannot be used as the primary reason for carrying out seismic activities.

6.2 Other Recommendations

6.2.1 Future Consultation

The CNSOPB should determine appropriate means of consultation when considering future exploration and development off the coast of Cape Breton.

6.3 Conclusions

As a result of the risks and benefits impacting different sectors and individuals, the members of the Ad Hoc Working Group have come to the following conclusions:

- Some believe the risks are relatively small compared to the potential future economic benefits which, depending upon the outcome of exploration activities could be very significant for Cape Breton; and that the regulatory system is capable of authorizing activities under appropriate terms and conditions for mitigation and monitoring.

- Some believe the risks from seismic testing in the three licence areas are unacceptable and thus the prohibition on exploration activities should be continued.

- Some believe the risks are so unacceptable as to require the cancellation of the licences and a moratorium be declared on all oil and gas activities in the inshore area of Cape Breton Island until such time as adequate science has been conducted and adequate mitigation measures have been developed for these activities.

7.0 DOCUMENT ACCEPTANCE

The undersigned members of the Ad Hoc Working Group agree that this report is a fair representation of views expressed throughout meetings of the group over the past several months. However, individual members of the Ad Hoc Working Group held differing views on many aspects of this report and, with the exception of statements identified as matters of consensus and recommendations, it should not be assumed that each member agrees with all statements made within this report. This document was finalized in February 2003 to be submitted to the Canada-Nova Scotia Offshore Petroleum Board as the Report of the Ad Hoc Working Group.

Duncan Smith
(Federal Government Representative)

Document not accepted
Osborne Burke
(Fisheries Representative)

Bruce Cameron
(Provincial Government Representative)

Elizabeth May
(Environmental Organizations Representative)*

Ken Anderson
(Municipal Government Representative) **

Robert McCharles
(Business Representative)

Joe Marshall
(First Nations Representative)

Cliff Murphy
(Trade Union Representative)

Document not accepted
Clarrie MacKinnon
(Fisheries Representative)

Norman Miller
(Licence Holder)

Document not accepted
Fred Kennedy
(Fisheries Representative)

Glenn Miller
(Licence Holder)

Jeff Brownstein
(Fisheries Representative)

Andy Parker (Chair)
(Canada –Nova Scotia Offshore Petroleum Board)

* Signing on behalf of the Sierra Club of Canada and the World Wildlife Fund

** Signing on behalf of the Municipalities of the Counties of Inverness and Richmond, The Cape Breton Regional Municipality, and the Town of Port Hawkesbury.

APPENDIX A

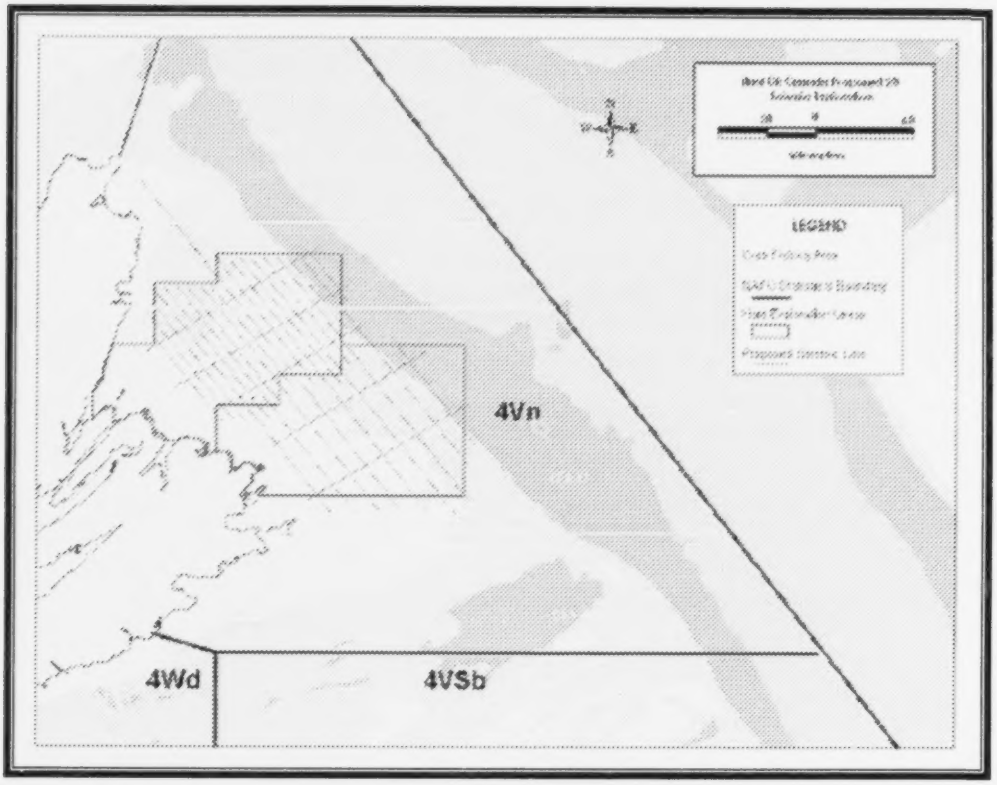

Figure 1 – Site Map for seismic activities proposed by Hunt Oil Company.

APPENDIX B

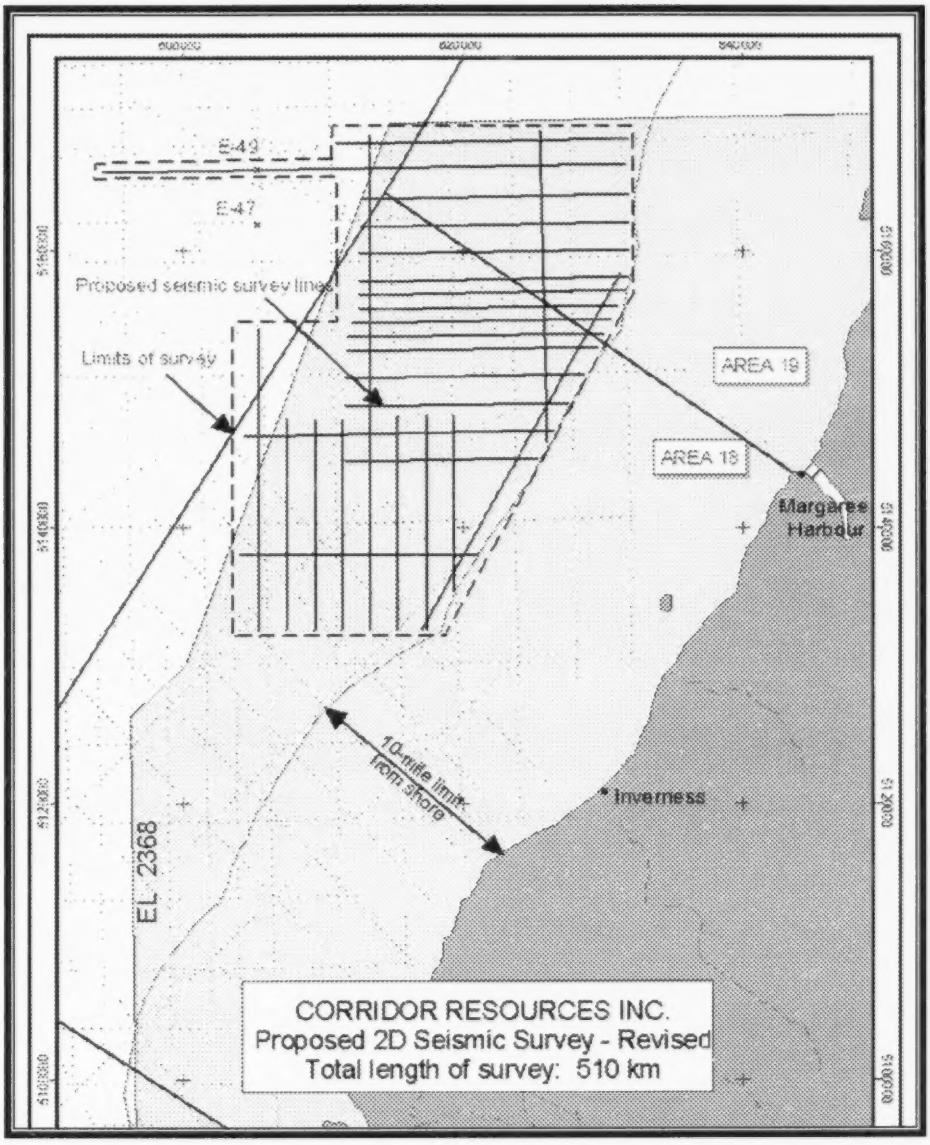

Figure 2 – Site Map for seismic activities proposed by Corridor Resources Inc.

APPENDIX C

Table 1 – Ad Hoc Working Group Participant List

Agency	Participant	Alternate
Federal Government	Tim Shanks Natural Resources Canada	Duncan Smith Natural Resources Canada
	Ted Potter Dept. of Fisheries and Oceans	Chris Morry Dept. of Fisheries and Oceans
Provincial Government	Bruce Cameron NS Department of Energy	Jack MacDonald NS Department of Energy
Municipal Government	Ken Anderson	Carter Stevens
First Nations	Joe Marshall Union of Nova Scotia Indians	Kimberly Paul Union of Nova Scotia Indians Trevor Kenchington
Fishing Organizations	Jeff Brownstein Maritime Fishermen's Union	Nathalie Brun Maritime Fishermen's Union
	Osborne Burke North of Smokey Fishermen's Association	Greg Organ North Smokey Fishermen's Association
	Clarrie MacKinnon Gulf N.S. Fleet Planning Board	Herman Deveau Inverness North Fishermen's Association Leonard LeBlanc Gulf N.S. Fleet Planning Board Ian MacDonald Gulf Fisheries Petroleum Advisory Board
	Brian Adams Area 19 Snow Crab Fishermen's Association	Fred Kennedy Western Cape Breton Snow Crab Fishermen Bill MacDonald Area 19 Crab Fishermen's Association
Environmental Organization	Elizabeth May Sierra Club of Canada	John May
Business Organizations	Mr. Robert McCharles	
Trade Union Organization	Mr. Cliff Murphy Cape Breton Island Building and Construction Trades	Gerry Shanahan
Licence Holders	Mr. Norman Miller Corridor Resources	Paul Hopkins Corridor Resources Paul Durling Corridor Resources
	Mr. Glenn Miller Hunt Oil	Chris Wickens Hunt Oil
Chair	C. Andrew Parker CNSOPB	
Secretariat	Eric Theriault CNSOPB	
	Erin Palmer CNSOPB	
	Barbara Pike CNSOPB	